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# INTERNATIONAL ABSTRACT OF SURGERY

JANUARY, 1921

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Capelle: Postoperative Thrombosis and Embolism**  
(Einiges zur Frage der postoperativen Thromboembolie). *Beitr. z. klin. Chir.*, 1920, cxix, 485.

Emboli are of two basic types depending on the location and height of the occlusion. Small clots enter deeply into the lung tissue toward the periphery and in such cases the syndrome is essentially pleuropneumonic. Large clots in the pulmonary artery or its main branches obstruct the circulation. In the clinical picture shock, cardiac syncope, and asphyxia predominate until death. Embolic pleuropneumonias are indicated frequently by bloody sputum but not always. The presence or absence of this symptom depends upon the establishment of collateral circulation in the blocked area. Thrombosis of the lower half of the body or varices predisposing to such thrombosis were found in only 4 of 11 cases. The usual right sided location, especially in the lower lung areas—13 out of 15 cases—is almost a pathognomonic sign. In 12 cases the condition followed a laparotomy.

Aspiration pneumonia begins almost immediately and hypostatic pneumonias in the first few days after operation. Embolic pneumonia and embolism of large vessels usually do not develop until some time later. In most of the cases reviewed by the author the condition began between six and fifteen days after the operation. As a rule the first symptom is severe pleuritic pain. This is followed shortly by a rub due to an associated pleuritis.

In 26 clinical cases of embolism the diagnosis was found to be incorrect in 9, almost one-third. Either cardiac failure with sudden onset was mistaken for an embolism or embolism was overlooked because of failing heart action. Myocardial dysfunction predisposes less to embolism than to thrombosis whereas good cardiac action predisposes less to thrombosis and more to embolism if peripheral thromboses are present. The diagnosis of pulmonary embolism therefore depends upon a severe

disturbance of the pulmonary circulation, i.e., a general clinical picture. There is no pathognomonic symptom. The significance of prodromal increase in the pulse rate, peripheral thrombosis, and embolic cardiac murmurs is uncertain.

In 2 cases operative interference was attempted upon patients who were dying but was unsuccessful. Nine patients died during the first five minutes of the first attack. In 6 of the remaining 8 cases the final attack was preceded by several others. Two patients survived the attack, and 1 had been discharged from the hospital when the embolism ended his life.

The author discusses also the technique of operation and its indications.

BOEST (Z).

### ASEPTIC AND ANTISEPTIC SURGERY

**Specht, O.: The Therapeutic Application of Vuzin in Civil Surgery** (Ueber die therapeutische Anwendung des Vuzins in der Friedenschirurgie). *Beitr. z. klin. Chir.*, 1920, cxix, 288.

Bier was the first to introduce into surgical practice the use of eucupin, the quinine derivative isolated by Morgenroth and Tugendreich. He employed this substance in the prophylactic treatment of war injuries. Klapp used the more effective quinine derivative, vuzin. According to laboratory experiments, vuzin is able to kill staphylococci and streptococci. A further advantage is its comparative harmlessness to the tissues. Klapp developed the technique of its use more exactly and claims that he has obtained relatively good results with it.

The author observed generally good results from the use of the drug as a prophylactic agent in freshly infected wounds on the battle field. Later its therapeutic possibilities became recognized. Mention is made of the early therapeutic experiments of Bier who undertook to treat walled-off abscesses and carbuncles with vuzin. Bier established the fact that vuzin injected into wounds does not kill the bacteria but diminishes their virulence, and



thus enables the body to overcome the infection by its natural resistance. These conclusions have been confirmed in part by other investigators.

At the Giessen Clinic vuzin was tested in the treatment of closed abscesses, circumscribed phlegmons, and tendon-sheath suppurations. In cases of pyæmia it was injected intravenously. In addition to the use of vuzin, only the necessary surgical measures were undertaken. The abscesses were punctured, the pus allowed to drain, and the cavity then filled with a 0.2 per cent solution of vuzin-novocaine. It was found that this treatment had no advantage over free incision, the technique of which is more simple. Circumscribed phlegmons and carbuncles require injections around and underneath the affected area. These injections must be repeated often, and moist dressings must be applied frequently. In the cases reviewed the results were similar to those obtained in closed abscesses; they were good but did not surpass the results given by the common methods of treatment. In such cases a simple incision and moist applications are all that is necessary.

In the treatment of far-advanced phlegmons and tendon-sheath suppurations with vuzin small incisions were made over the infected tendons and a 0.2 per cent vuzin-novocaine solution was injected into the sound tissues surrounding the infected area until the drug came out of the incisions. For the next few days the wound was covered with vuzin dressings. In almost every case a phlegmon of the palm of the hand was overcome either primarily or secondarily. After the injection a strikingly severe inflammatory œdema developed which at first was very painful but disappeared within four or five days. Undoubtedly this is a great disadvantage in the method under discussion. In three cases, after the subsidence of the inflammatory œdema secondary abscesses developed in the region of the injection. From the general results the author concludes that local vuzin treatment is not to be recommended for advanced phlegmon and tendon-sheath infections. More can be accomplished by surgical measures alone.

Four cases of pyæmia treated by intravenous injections of vuzin are discussed. In one case slow but permanent improvement set in after fourteen days. Whether the vuzin was responsible for this or not it is difficult to state. In one case, however, the vessel wall was severely damaged by the vuzin.

In summarizing, the author states that the treatment of closed abscesses with vuzin cannot compete with the usual surgical measures. In advanced phlegmons the method has totally failed. In generalized bacteræmia the intravenous administration of vuzin has not proved definitely satisfactory.

Косн (Z).

**Steinmann, F.: Antisepsis with Gaseous Antiseptics** (Antisepsis mit gasförmigen Antiseptics). *Schweiz. med. Wchnschr.*, 1920, 1, 509.

Since 1913 Steinmann has used a continuous oxygen stream in the treatment of foul-smelling

abscesses. The oxygen is admitted into the wound through a drain, and leaves the abscess through another drain. When the abscess is situated in the abdominal cavity the treatment is undertaken only after the suppuration has become walled off. When the suppuration is generalized in the lower peritoneal cavity a rubber drain is inserted at the lowest point of the pelvis and the oxygen treatment is begun on the third or fourth day. The oxygen is allowed to enter under a pressure of from 20 to 25 cm. of water. Its effect is seen in the disappearance of the foul odor within from one-half to two days, in the rapid drying up of the secretion which soon makes it possible to shorten the drain and then to remove it entirely, and in the formation of normal granulation tissue.

This method of treatment may be applied also to empyema, periostitis of the mandible, and suppurative gunshot fractures. Oxygen is a very effective and harmless antiseptic in anaerobic or mixed infections. Instead of pure oxygen the oxygen in the air may be utilized, the stream of air being passed into the wound through a rubber tube by a hydrostatic blast or an electric air pump. This method is somewhat slower. The patient is able to care for the apparatus himself. Occlusion of the opening of the tube is prevented by cleaning the catheter once or twice a day and by covering the wound with a thin antiseptic dressing. The effect of the method is partly mechanical, the pus being drained from the bottom of the abscess, and is due partly to the drying effect of the oxygen. The chief action, however, is of a chemical antiseptic nature. Chudiakow has shown beyond dispute that oxygen first weakens the productiveness of anaerobes and later kills the bacteria and their spores. On aerobic organisms Joris found that it has no special bactericidal effect but the power of the bacteria is sapped and their toxins are destroyed by oxidation. Joris believes that oxygen causes a leucocytosis and thus increases phagocytosis.

According to DeMoor's experiments, even the aerobes do not tolerate an excess of oxygen very well. Lippens also found that their virulence is diminished by oxygen, the decrease becoming greater the more these organisms assume the characters of anaerobic bacteria. Ries went a step further, studying the effect of volatilized iodine, formalin solution, chloroform, eucalyptol, ether, etc. Formalin, when mixed with air or oxygen, dried up a suppurative area in a few hours. For this purpose a 1 per cent solution is necessary. A 10 per cent solution of tincture of iodine helped to stop the exudate through its powerful effect on the aerobes. The chloroform mixture sterilized the dressings in three minutes and was found to kill lice and nits all pyogenic organisms, and even the spores of bacteria.

By this gaseous method many drugs which in liquid form are valueless as antiseptics are rendered effective. Moreover, the dosage necessary is smaller and its effect persists longer. Bött (Z).



## ANÆSTHESIA

Carter, W. S.: The Effect of Ether Anæsthesia on the Alkali Reserve; An Experimental Study. *Arch. Int. Med.*, 1920, xxvi, 319.

Carter states that many of the observations to determine the influence of anæsthesia on the alkali reserve have been made on patients after surgical operations. As the alkali reserve may be decreased by the restricted diet or fasting preparatory to surgical operations and as the same condition is usually present in surgical shock, such determinations should be made on animals.

The conclusions reached from experimental study are summarized as follows:

1. Ordinary ether anæsthesia, without any of the contributing conditions which attend surgical operations, causes a distinct decrease in the alkali reserve. The decrease in the carbon dioxide combining capacity of the blood of dogs is usually from 6 to 8 volumes per cent.

2. The diminution occurs almost entirely after the first hour and is in direct proportion to the duration of the anæsthesia.

3. The decrease in the alkali reserve is actual and not an apparent condition due to hyperpnœa. The latter is most marked early in the anæsthesia but there is little or no de-alkalization during the first hour. The usual decrease occurs when the anæsthesia is maintained by artificial respiration which provides a uniform respiratory volume; also when the animal breathes an atmosphere containing

3 per cent of carbon dioxide in which ether has been vaporized.

4. Breathing an atmosphere containing 16 per cent of oxygen and 3.5 per cent of carbon dioxide for three hours does not diminish the alkali reserve.

5. The greatest decrease in the alkali reserve produced by ether anæsthesia occurs at the end of the anæsthesia and remains at that level for from one-half to one hour after the anæsthesia, at a time when the respiratory activity is decreased. Following this brief after-effect the alkali reserve rapidly increases and returns to normal in from one to two hours after the anæsthesia.

All of the experiments presented were performed on normal dogs. The decrease in the alkali reserve never reached a dangerous level and continued only for a short time after the anæsthesia. From the observations reported it is impossible to conclude what might occur in cases in which there is a reduction from altered metabolism before a surgical operation or the patient is in a condition of surgical shock attended by a reduction in the carbon dioxide combining capacity of the blood. Such conditions added to that produced by the ether may be more serious. It should be remembered also that even by injecting large amounts of a mineral acid into the circulation, it is extremely difficult to produce in dogs the condition known as acidosis, as they are able to protect themselves against acids by the alkali reserve of the body and by their ability to form ammonia salts in protein metabolism.

ISABELLA C. HERB.

## SURGERY OF THE HEAD AND NECK

## HEAD

Emerson, F. P.: Clinical Manifestations of Infection of the Lateral Sinus. *J. Am. M. Ass.*, 1920, lxxv, 372.

The author advocates the use of the term "sinus infection" as a comprehensive term covering three conditions: phlebitis, thrombosis, and septicæmia. The differentiation between these types is often extremely difficult. The symptoms vary with the infecting organism, the avenue of invasion, the stage of the complication, and the resistance of the host. The diagnosis can be made only from a study of the history, local conditions, and blood findings. There is no typical picture. Many cases with meningeal symptoms due to a bacteræmia from an infected sinus cannot be differentiated from cases of acute meningitis.

Sinus infection, one of the most uncommon complications of mastoiditis, should always be operated upon. Often it may be diagnosed by exclusion. Ligation of the jugular vein is to be recommended in all cases in which mastoiditis is followed by symptoms of meningitis and incipient sinus infection. Exploration to ascertain the condition of the sinus and prompt ligation of the jugular vein,

if necessary, are safer procedures in septic cases than expectant treatment, and in the author's opinion will often save life.

Emerson reports two instructive cases of sinus infection and sepsis in patients with mastoid disease who recovered after operation and ligation of the internal jugular. The most constant local symptoms of sinus trouble in his experience have been oedema and tenderness over the emissary vein, but these are present also in perisinous abscess and in some cases of mastoiditis. Tenderness over the upper part of the jugular vein is relatively rare and was noted only a few times. A septic temperature associated with leucocytosis and a high polymorphonuclear percentage is an important general indication in severe cases. In the presence of an elevation of temperature and an increasing leucocytosis, the only safe course is to shut off the general circulation from the infection.

J. J. KING.

Heuer, G. J.: Surgical Experiences with an Intracranial Approach to Chiasmal Lesions. *Arch. Surg.*, 1920, i, 368.

The proportion of suprasellar lesions to hypophyseal lesions is greater than is evident from the literature and therefore a larger number of chiasmal



lesions must be approached by an intracranial route.

The great majority of hypophyseal lesions are adenomata, and of these 80 per cent are solid, and 20 per cent are cystic tumors. Probably 50 per cent of the supracellar lesions are cysts which may be drained.

The primary direction of growth of hypophyseal lesions is toward the intracranial chamber. The intracranial extensions are primarily forward in front of the chiasm and between the optic nerves—in a direction, therefore, which makes them accessible by an intracranial approach.

Visual disturbances and destruction of the clinoid processes invariably point to an intracranial growth of the lesion; their absence, however, does not preclude this possibility.

The differential diagnosis between hypophyseal and supracellar lesions at certain stages in their growth is very uncertain.

With the exception of the late posterior intracranial extensions of hypophyseal lesions, every chiasmal lesion which presents symptoms requiring surgical relief is accessible by an intracranial approach. In some cases, however, the condition is not operable.

The cystic tumors, whether hypophyseal or supracellar, are prone to recur, and as yet the author has been unable, by an intracranial approach, to prevent their recurrence.

The solid hypophyseal tumors, with the exception of rare posterior extensions, may be removed. When they are large, their removal has been attended by a high mortality but when they are small the mortality is much lower.

The true lesions of the optic chiasm are few and may be removed. In the author's one case of a lesion of this kind the patient lived for four years quite free from symptoms.

The supracellar solid tumors Heuer has been unable to remove completely. In one instance, however, he cured an internal hydrocephalus causing marked pressure symptoms by partial removal. This patient is still living and free from symptoms five years after the operation.

As to the choice of operative procedures in the cases of patients who present signs of a chiasmal lesion, the author states that both the trans-sphenoidal operation and the intracranial operation he has used have a field of usefulness. In the early cases with sellar headaches and evidences of secretory derangement but without visual disturbances or destruction of the clinoid processes of the sella turcica, a trans-sphenoidal operation may meet the requirements. A certain number of the patients may remain well for long periods, but a fairly large number will sooner or later develop an intracranial extension of the growth causing visual disturbances and destruction of the clinoid processes. Just as soon as these signs appear, the trans-sphenoidal approach will fail to deal adequately with the lesion. Therefore, instead of repeating the procedure, it

would appear wise to resort to an intracranial operation.

For all other chiasmal lesions which, at the time they are first observed, are associated with visual disturbances and alterations in the shape and size of the sella turcica, the intracranial operation is the procedure of choice, for in such cases an intracranial tumor is present. The mortality following this operation is high at present, but if it is performed before the intracranial growths are too large, the danger is much less.

E. C. ROBITSHEK.

**Sachs, E., and Belcher, G. W.: The Use of Saturated Salt Solution Intravenously During Intracranial Operations: Preliminary Report.**  
*J. Am. M. Ass.*, 1920, lxxv, 667.

It is a fundamental principle that the dura must not be opened while under tension. Spinal puncture is dangerous under such circumstances. The authors have used ventricle puncture with good results, but in certain cases of brain tumor this procedure is not possible.

It was found by Weed and McKibben that when animals are given intravenous injections of saturated salt solution (35 per cent), the brain shrinks as the result of dehydration of the tissues and there are no untoward effects. The authors therefore applied this method to a case of brain tumor, giving 100 ccm. of a saturated salt solution intravenously at the rate of about 1 ccm. per minute. After the third injection the pressure symptoms cleared up steadily and the patient made an uneventful recovery following decompression. During a later operation for the removal of the tumor the salt solution was again administered in order to keep the cranial pressure low.

The method has been used successfully also in the treatment of a few cases of cerebral oedema.

M. H. HOBART.

**Adson, A. W.: The Surgical Treatment of Brain Abscess.** *J. Am. M. Ass.*, 1920, lxxv, 532.

The author reviews the literature briefly and emphasizes the frequency of abscess of the brain during the second and third decades of life. He states that the principal causes of pyogenic abscess are middle ear disease, frontal sinusitis, trauma, and chronic pyogenic infections.

Abscess of the brain occurs more frequently in the frontal and temporal lobes than in other parts of the brain, and unless it is the sequela of a chronic hæmatogenous infection, it occurs singly. It passes through three distinct phases, the initiatory, the quiescent, and the terminal. In the initiatory stage the process is more apt to be one of encephalitis than of cell destruction and pus formation, and is rarely improved by surgery. In the quiescent stage the encephalitis subsides and the process becomes circumscribed and is surrounded by a capsule which diminishes the absorption of toxic material. If the abscess is thoroughly drained with little or no con-



tamination of the dura, satisfactory recovery results. The terminal stage is manifested by delirium, coma, stertorous breathing, meningismus, dilatation of the pupils, rapid pulse, and paralysis, and may develop at the termination of the initiatory stage or follow the quiescent stage as a result of rupture and secondary infection.

The author reports a series of 26 cases and reviews the etiological factors as well as the pathologic findings which were verified in 23 instances either by operation or necropsy. He gives a tabulated account of the frequency of the various symptoms and clinical findings and emphasizes the importance of operating during the quiescent stage. Frequently, however, this stage is unrecognizable because the symptoms are those of intracranial pressure and are hard to differentiate from those produced by a brain tumor.

Nine of the 26 patients were operated on; 5 recovered and 4 died. Seventeen were not operated on; 2 uncertified patients recovered and 15 died. In 16 cases the average duration of symptoms was thirty-two days; 4 of these patients were operated on for brain abscess and died. Five patients with an average duration of symptoms of six months recovered following drainage of the brain abscess. Of 5 patients with an average duration of symptoms of twenty-seven months, 2 recovered slowly and 3 died.

In his résumé the author states that surgical treatment is of little value in the initiatory or terminal stages or in the presence of meningitis, but that it is of great value during the quiescent stage. If there is doubt as to the differential diagnosis between brain tumor and brain abscess in the quiescent stage an exploratory craniotomy is advisable.

**Williamson, C. S., Brown, R. O., and Butler, J. W.:**  
A Study of the Effects of Radium on Normal Brain Tissue; A Preliminary Report. *Surg., Gynec. & Obst.*, 1920, xxxi, 239.

The author states that the use of radium is indicated unquestionably in the treatment of many brain tumors. The matter of dosage, however, presents a problem which as yet has not been settled. Experience has shown the dosage required to destroy certain tumors, but the question arises as to the injury such dosage may inflict on the normal brain tissue.

Experimental work on dogs was undertaken by the authors to determine the reaction produced in normal brain tissue by various applications of radium. In order that the functional disturbance and structural changes might be observed, the radium was placed over the motor cortex. All tissues above the dura were removed over a small area, the dura was incised, and the radium inserted for periods of four, six, twelve, and eighteen hours. During the application no symptoms whatever appeared. After the removal of the radium the bone flap was removed, the soft parts were replaced, and the wound was

allowed to heal. The radium was screened in 0.4 mm. platinum. The results are given briefly as follows:

Dog No. 2. Four hours' exposure, 25 mgm. of radium. Uneventful recovery. No signs nor symptoms had developed after sixteen weeks.

Dog No. 3. Six hours' exposure to 50 mgm. of radium. No signs or symptoms attributable to the radium developed during the first three weeks. The animal was then killed and examined. On microscopic examination necrosis of tissue over an area 0.4 by 2.5 cm. on the surface of the brain and extending about 2 mm. into the tissue was observed. There was marked degeneration of the nuclei with considerable hyperæmia, but the blood vessels were intact and there was no hæmorrhage.

Dog No. 4. Twelve hours' exposure to 50 mgm. of radium. Autopsy was performed at the end of three weeks. Microscopic examination revealed an area of hyperæmia 0.9 by 3 cm. in size, through the center of which was a black and necrotic strip 4 mm. wide which corresponded to the point of contact of the tube. There was complete degeneration of the cells along this portion of the lesion for a depth of 5 mm. The blood-vessel walls in this area were three or four times their normal thickness, hyalinized, and congested. Along the periphery of the necrotic area the blood-vessel walls were ruptured and there was considerable hæmorrhage. Beyond this hæmorrhagic area the vessels were congested and the cells appeared normal.

Dog No. 5. Eighteen hours' exposure to 50 mgm. of radium. The results and findings in this case resembled those observed in the case of Dog 4 except that the necrosis and degeneration were more marked and more extensive.

Dog No. 7. Twelve hours' exposure to 50 mgm. of radium. On the second day convulsive and inco-ordinated movements were noted which at times were athetoid in character and separated by intervals of quiet. Autopsy on the third day revealed encephalitis.

The time required to kill malignant tumor cells depends upon the milligram-hour dosage and the distance of the outermost tumor cells from the radium. Six hundred milligram hours' irradiation with the gamma rays will kill cancer cells for a distance of 1 cm. A dosage four times as great is necessary to destroy malignant cells at a distance of 2 cm. The dosage necessary to destroy sarcoma is usually smaller. In treating brain tumors the law of inverse squares should be borne in mind when considering the dosage and the size of the tumor. When the dose used is just sufficient to destroy a tumor of a given size, it is safe to assume that the adjacent normal brain tissue will not be injured seriously.

The conclusions based on the experiments reported are as follows:

1. The gamma rays after passing through 0.4 mm. of platinum penetrate brain tissue and have a destructive action within a radius of 5 mm. when the dosage is 900 milligram hours.



2. The effect upon the blood vessels varies according to the distance from the radium and the number of hours of treatment.

3. The experiments give assurance that in the case of brain tumors which respond readily to radium little or no damage will be inflicted upon the brain tissue surrounding the tumor if the radium is implanted in the growth. The dosage employed on the growth may be regulated so that it is destructive only to the periphery.

W. L. BROWN.

**Frazier, C. H.:** The Effects of Radium Emanations upon Brain Tumors. *Surg., Gynec. & Obst.*, 1920, xxxi, 236.

Malignant tumors of the brain differ from malignant tumors of other organs or structures in that they do not form metastases and they grow very slowly. The rate of growth varies somewhat with the type of the tumor. The cardinal symptoms of brain tumor are attributable often to secondary ventricular distention rather than to the presence of the neoplasm.

Some brain tumors are not well defined or well encapsulated. Hence removal is impossible and palliative measures are indicated. In such cases radium has been found very useful as it arrests the growth and may even lead to retrogression of the tumor mass. The author cites three cases from a series of 24 as illustrative of the action of radium.

Case 1 was that of a patient who had an inoperable tumor of the pontile angle. Eighty-five milligrams of radium were embedded in the tumor for a period of fifteen hours. In six weeks improvement was noted; in four months the patient was ambulant; and after six years he was still alive and in fair condition although some signs of cerebellar disturbance persisted.

The second case cited was a case of cerebellar tumor on the left side. The patient was in a grave condition when first seen. Serial application of radium was given following suboccipital decompression. The symptoms gradually improved and after the fourth application, three years after the first, the physician in charge reported: "The symptoms of her cerebellar ataxia have nearly disappeared. She can walk without assistance and with little uncertainty in her gait. She plays with other children and takes part in their outdoor games. The right eye shows a pale disc but her vision equals 8/10 plus. In the left eye (which is divergent) there is a marked atrophy of the optic nerve and vision only 1/10. She goes to school and keeps up in her studies with other children. The inference is that there has been at least an arrest of the disease and what remains is the expression of the damage already accomplished before she came under your care."

In Case 3 there were visual disturbances and recurrent headache following a sella decompression. The patient gave a history also of amenorrhœa for three years and ocular disturbances. The treatment included X-ray and radium therapy with thyroid

and pituitary feeding. Three years later the headaches were less severe, menstruation had been established after six years' cessation, scotomata had disappeared entirely, and the vision was normal. As in this instance other therapeutic measures were employed credit must not be given entirely to the radium therapy. The radium was applied to the pituitary body through the posterior nares. The case is worthy of consideration because secondary attempts to operate on the sella are either difficult or impossible and the results indicate that we have other means of helping such patients after failure in the first operation.

The author states in conclusion that this work is only in the developmental state but promises a great deal when properly conducted. He prefers the embedding of the radium in the tumor to distant or indirect applications. Research work is being conducted to determine what dosage may be used properly and with safety. Gliomata react little to radium, while endotheliomata are unquestionably more susceptible.

W. L. BROWN.

**Petersille, P.:** The Weight of the Hypophysis in Man and Its Relationships (Das Hypophysengewicht beim Manne und seine Beziehungen). Langensalza: Wendt and Klauwell, 1920.

Petersille undertook to weigh the hypophysis in autopsies on soldiers at the Pathological Institute at Jena in order to determine whether there is any relationship between its weight and that of other organs and the body as a whole. The average weight of the hypophysis was found to be 621 mg. but there were many deviations from the average. Only about 19 per cent weighed between 600 and 650 mg., while 50 per cent weighed between 550 and 700 mg. Simmond's figures are much higher, between 660 and 741 mg. A marked influence of geographical factors on the weight was not noted. The weight attains its maximum in the third decade, remains constant in the fourth and fifth decades, and then slowly decreases again.

The average weight of the hypophysis increases with the length of the body or, vice versa, the average body length varies with the increase in the size of the hypophysis. This finding is in agreement with the fact that in cases of gigantism the skull shows a marked widening of the sella turcica and the volume of the hypophysis is increased. Moreover, recent paleontological research confirms the assumption that the great size of the dinosaur was due to hyperfunction of the hypophysis. In the dinosaurs thus far studied the skull shows especially enlarged sellæ. It has been found also that when the weight of the hypophysis is high the skull is of a compact structure, while when the weight is low the skull is of a more porous structure. It is to be assumed that the body weight increases with the increase in the weight of the hypophysis.

After the removal of the thyroid or its destruction by pathologic processes, hypertrophy of the hypophysis sets in. In Basedow's disease no reduction



in the size of the hypophysis has been noted. The weight of the adrenals remains the same, but that of the testicle increases slowly with an increase in the weight of the hypophysis. In tall persons with large organs the hypophysis is heavier than in shorter persons. The average weight of the hypophysis is 0.046 per cent of the weight of the whole brain.

KLOSE (Z).

**Oppenheimer, S.: Implantation Methods in Cosmetic Rhinoplasty.** *Boston M. & S. J.*, 1920, clxxxiii, 329.

The autoplasmic operation is now used almost universally and the material is taken most frequently from a rib or one of the tibiae. For the best results bone must be laid down where bone was present before and cartilage where cartilage was present. The author's technique is as follows:

Under aseptic precautions and local anaesthesia a segment about 2 in. in length and consisting of two-thirds rib and one-third costal cartilage is taken from the ninth rib, the periosteum on the anterior surface being preserved. This segment, which is only down to the diploic structures in thickness, is then fashioned to fit the deformity to be corrected. The nose is prepared externally and internally with tincture of iodine and anesthetized internally with 10 per cent cocaine. The subcutaneous tissues are injected with a 1 per cent cocaine solution.

The tip of the nose is raised and a small spatula-shaped knife is introduced into the nasal cavity at a point directly below the level of the nasal bone. Through this opening the tissues over the dorsum and lateral aspects of the nose are freely elevated and undermined. The extent of the undermining depends upon the nature of the deformity and the size of the implant to be inserted. After the preparation of a suitable pocket over the dorsum, the transplant is introduced intranasally and slipped down into position by pulling on the tip of the nose for manipulation of the lower end of the transplant, while the upper end is securely tucked under the periosteum in close contact with the frontal bone.

When the deformity is marked, several fragments of bone are superimposed, this being preferable to the use of one large fragment as small transplants have been found to possess relatively greater osteogenetic power. As a rule no suture is required to hold the transplant in position. In general, drainage is not necessary. The vestibules are packed with petrolatum gauze or bismuth-petrolatum gauze, and externally the nose is protected by a splint of dental compound held in place by adhesive straps across the face and nasal dorsum.

H. A. MCKNIGHT.

## NECK

**Thost: Gunshot Wounds of the Neck** (Ueber Halsschuesse). *Ztschr. f. Ohrenh.*, 1920, lxxix, 190.

In this article the author reports 11 cases of gunshot wounds of the neck. With few exceptions all neck wounds cause dyspnoea. Therefore tracheot-

omy is frequently necessary in such cases. Later, when the cannula is removed, an abscess may develop in the wound canal and, like a long-remaining foreign body or bullet, may cause stenosis and necessitate a second tracheotomy. Scar formation may lead to stenosis also secondarily.

Thost divides stenoses into bending stenosis, granulation stenosis, and scar stenosis. These forms may occur alone, or in combination. Fistulae remaining after gunshot wounds may be treated by plastic operation only when the stenosis has been corrected. Thost claims that surgeons often pay too much attention to the closure of the fistula and too little to the stenosis so that a tracheotomy frequently becomes necessary after the fistula has been closed. Laryngologists, however, generally dilate the stenosis before attempting treatment of the fistula. If possible, bloodless dilatation of the stenosis should always be attempted. An incision should be made only when the stenosis is so acute that even the very thinnest dilator will not pass through it.

Granulations may be treated either from the mouth or through the tracheotomy wound with caustics or the galvanocautery. If this does not suffice, the use of the snare or cutting instruments is necessary. Mechanical dilatation is best carried out with graduated sounds introduced either through the mouth or through the tracheotomy wound. A stenosis must always be dilated more than the permanent size necessary as a certain amount of contraction is inevitable. In all cannula carriers the mucosa of the trachea is chronically inflamed and frequently this is the forerunner of bronchitis or pneumonia.

Good X-ray pictures are of considerable value in the treatment of gunshot wounds of the neck as they will show whether the sounds are correctly placed or not.

In several of the cases reported operative intervention was necessary for fistulae of the oesophagus. With the exception of 2 patients who died of bronchopneumonia and myocarditis, all were cured or greatly benefited by the treatment given.

VON TAPPEINER (Z).

**Porter, M. F.: Goiter: A Clinical Study of 139 Cases.** *Ann. Surg.*, 1920, lxxii, 129.

The group of cases studied included only those seen between November, 1912, and August 18, 1919, the records of which were kept on file in the office. One hundred and twenty-one of the patients were females and 18 males, the proportion of males to females being therefore 1:6.7. Seventy-four of the 139 patients presented themselves because of symptoms developing in old and heretofore symptomless goiters. The youngest patient was 16 years and the oldest 70. The average age was 35.5 years. The percentage of married to unmarried females was practically the same as the percentage of married to unmarried females throughout the state. The percentage of fruitful marriages in this group



was 18.16 per cent less than the normal as given by Norris.

Ninety-nine patients were treated surgically, 81 by thyroidectomy, 18 by injections of boiling water, and 3 by both forms of treatment. In one case the right lobe was removed some months after the removal of the left by another operator. A large number of the specimens were examined microscopically.

In 5 cases the condition was pronounced malignant, but in only 2 was the suspicion of malignancy entertained prior to operation. At the present time, from three to six years after the operation, all of the patients except one report themselves as well. The one who is not well states that she thinks her neck is enlarged. The author has not seen her. As this cancer incidence is about three times larger than that generally given and the percentage of cures is suspiciously high, Porter presents the microscopic pictures in order that the reader may judge for himself.

Only 1 patient presented slight symptoms of parathyroid trouble after operation and these soon subsided. In 2 cases there was involvement of the recurrent laryngeal nerve. In 1 of these cases the condition seems permanent. One of these patients had had attacks of aphonia prior to the operation. The results of operative treatment were very satisfactory.

One very neurotic patient gained in weight as a result of treatment but lost none of his nervous symptoms. Exophthalmos when present was greatly benefited but not cured. No deaths were attributable to the injections of boiling water. Of a number of patients given such injections who were advised to have a thyroidectomy done later, only 5 followed this advice, the others being satisfied with the improvement which followed the injections.

Three deaths followed thyroidectomy. The major operation should have been refused in all of these cases and an attempt made to ameliorate the symptoms by the use of boiling water or ligation. Coincident operations on patients who stand thyroidectomy well are not contra-indicated.

Seventeen thyroidectomies were done for simple goiter. This group throws no light on the relation between goiter and local infections. Local anaesthesia was used in 7 cases and local and general in 2. Ether alone was given in 67. Routine blood examinations were not made as they were not considered important.

There was no serious reaction in any operative case. Troublesome hæmorrhage occurred in 2 cases. Stimulating treatment during and after operation was seldom necessary.

**Freeman, L.: A "Tourniquet Operation" in Toxic and Other Goiters.** *Ann. Surg.*, 1920, lxxii, 161.

Freeman has used the tourniquet operation described 182 times and has found it applicable to all goiters except those which are calcified.

The necessary equipment consists of a number of ordinary strong rubber bands 2 or 3 in. long and somewhat thicker than the head of a pencil; 2 pieces of wire, 3 or 4 in. long, of the same diameter, with the ends turned over into small loops to prevent injury to the surgeon's gloves and the tissue; and a pair of small alligator forceps.

The technique is that of the ordinary goiter operation as far as the dislocation of the lobes. The subsequent steps are as follows:

1. One of the thoroughly dislocated lobes is elevated.

2. The alligator forceps are plunged through the base of the lobe near its center, close to the trachea, and a rubber band is grasped and pulled through so that an end projects from either side. This manoeuvre is repeated near each extremity of the lobe so that its base remains transfixed by three loops.

3. The wires, which must be long enough to project well beyond the lobe are passed through the loops on each side.

4. With the lobe well elevated and an assistant holding the ends of the wires together, the central band is pulled taut and clamped close to the wire with hæmostatic forceps, thus binding the wires firmly together. The two remaining bands are manipulated differently. After they have been pulled tense, each strand is wrapped in an opposite direction about the projecting ends of the wires before the clamps are applied.

5. The portion of the gland beyond the tourniquet is excised with a scalpel and scissors, only a sufficient cuff being left on either side for the insertion of a hæmostatic suture. The elastic contraction of the rubber bands maintains the hæmostatic pressure of the wires even though much tissue is removed from between them.

6. With a long catgut suture the raw area is whipped over, the lateral "cuffs" being utilized in the procedure. It may be desirable to go over the first suture line so as thoroughly to control the bleeding, but it is seldom necessary to tie any vessels separately, not even the thyroidal trunks.

7. After the forceps holding the rubber bands are unclamped, the wires and bands are removed.

8. The wound is closed and drained.

9. An enlarged isthmus may require separate handling or may be removed along with the lateral lobe by including it within the grasp of the tourniquet. It is not necessary to divide the isthmus in any but exceptional cases.

The advantages of this method of operating are several:

1. Bleeding from all vessels is completely controlled.

2. No hæmostatic forceps are required after the application of the tourniquet.

3. The wires cannot slip when the gland is cut away.

4. The safety of the recurrent laryngeal nerve and parathyroids is assured by the wedge-shaped excision.

CARL R. STEINKE.



**Martin, B.: The Condition of the Trachea After Goiter Operations** (Ueber das Verhalten der Trachea nach Kropfoperationen). *Deutsche Ztschr. f. Chir.*, 1920, cliv, 366.

The condition of the trachea after goiter operations was investigated in the cases of 49 patients operated on for goiter during the year 1917-18. The examination was made between three and sixteen months after the operation. The goiters were of various types, including exophthalmic goiter. The operative procedures varied according to the type of goiter from subtotal excision of the involved lobe, with perhaps a wedge-shaped excision of the other lobe, to enucleation of nodules and cysts.

After it had been determined by the X-ray which lobe should be resected the lobe which pressed upon the trachea was removed. In 5 cases the resection was done on the "wrong side," that is, on the side

toward which the trachea was displaced. As a rule displacement of the trachea was associated with narrowing of its lumen; displacement or narrowing alone was rarely observed. In the majority of cases the narrowing was overcome by the operation. Its persistence was due, not to resection of the wrong lobe of the thyroid, but to the loss of the elasticity of the tracheal cartilage. In most cases the displacement was decreased or overcome entirely. In 4 of 5 cases in which the result was negative the resection was done on the wrong side. Another factor causing persistence of the displacement was injury of the wall. In the lighter cases the dyspnoea was due chiefly to the pressure of the goiter.

The author concludes that the removal of the portion of the goiter which causes pressure generally leads to anatomical and clinical *restitutio ad integrum*. KLOSE (Z)

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Heuer, G. J., Pratt, G. P., and Mason, V. R.: Penetrating War Wounds of the Chest.** *Ann. Surg.*, 1920, lxxii, 352.

The authors began their treatment of penetrating wounds of the chest with a fairly definite routine: (1) expectant or medical treatment of all perforating bullet wounds and penetrating bullet and small shell wounds without open pneumothorax or extensive rib fractures, and (2) immediate operation upon: (a) those with open sucking pneumothorax; (b) those with acute continuous hæmorrhage threatening life; (c) those with large intrapleural or intrapulmonary foreign bodies; and (d) those with extensive rib fractures.

#### CASES TREATED EXPECTANTLY OR MEDICALLY

A slight or moderate grade of shock was usually present upon the patient's admission to the hospital. Cough, hæmoptysis, dyspnoea, and hæmothorax were the rule. Other conditions noted in a small percentage of the cases were mediastinal compression, extensive subcutaneous emphysema, hæmopneumothorax, simple pneumothorax, hæmorrhagic consolidation of the lung, and mild abdominal disturbances. The latter were rather common in low thoracic injuries. In most cases the foreign bodies retained were small (1 cm. or less in diameter). As a rule the clinical picture cleared up within a few hours after rest in a heated bed and the administration of morphine. Fever usually began to decline between the third and fifth day if complications did not develop.

The most frequent complication was infected hæmothorax which occurred in 17 per cent of the cases. This condition may develop within five days or from one to three weeks after the injury. Infrequent infectious complications included pneumonia (septic bronchopneumonia and lobular or

lobar pneumonia), pulmonary abscess and gangrene (which were exceedingly rare), septicæmia, pyæmia, purulent pericarditis, and infection of the parietal wound.

In cases of hæmothorax daily aspiration was done for culture if the condition was not progressing normally, and therapeutic aspiration was done to permit expansion of the lung and, if possible, to prevent the formation of adhesions, especially those obliterating the costodiaphragmatic angle. The best results were obtained by rib resection, drainage, the use of Dakin's solution, and later excision and closure of the sinus. The mortality in this group of cases was 8.5 per cent.

#### CASES TREATED BY IMMEDIATE OPERATION

Profound shock was the rule in cases of open sucking chest wounds. The symptoms were improved by closure. The wounds were large and there were rib fractures and extensive laceration of the skin, subcutaneous tissue, and muscles. If surgical treatment is not given in such cases death occurs almost invariably from profound shock within twenty-four hours or from infection later.

Three types of operations were carried out. The first was simple débridement of the soft parts without evacuation of the hæmothorax or the removal of the foreign bodies but with closure of the pleura and muscles, with or without closure of the skin. Infectious complications developed in 50 per cent of the cases and death resulted in 37.5 per cent.

The second operative procedure consisted of débridement, evacuation of the hæmothorax, suture of the wound, the removal of foreign bodies whenever possible, and closure of the pleura only, the muscles and skin being left open. Infectious complications developed in 33½ per cent of these cases and death resulted in 41.6 per cent.

The third procedure, which was the most complete and also the most successful, included com-



plete excision of the wounds in the lung whenever feasible, suture, and complete air-tight closure of the thoracic wound. Infectious complications developed in only 8 per cent of the cases so treated and death occurred in only 16 per cent.

Adhesions fixing the lung in high position were absent after the third operative procedure. In any given case all of the three main indications for operation are usually present, namely, the presence of a large foreign body, a large sucking wound, and extensive rib fractures. Acute primary hæmorrhage is a rare indication.

H. J. VANDEN BERG.

**Lenhart, C. H.: Open Pneumothorax: An Experimental Study of the Functional Pathology of Sucking Chest Wounds.** *Arch. Surg.*, 1920, i, 336.

Pneumothorax opening externally as the "sucking chest wound" of warfare or as the result of empyema operations is serious in character and of fairly frequent occurrence. This report deals with experimental pneumothorax in rabbits upon which a number of experiments were carried out, all conditions such as anaesthesia, operative technique, etc., being standardized.

In these experiments it was found that when one pleural cavity is opened the negative inspiratory pressure is reduced to practically zero, the lung collapsing to a certain extent but probably never completely. The mediastinum, if sufficiently elastic, is drawn to the sound side, the negative pressure on that side also being thereby reduced except insofar as the animal is able to compensate by increased respiratory effort. This decreases the alveolar surface so that the remaining functioning alveoli must be hyperventilated. In addition the "dead" space of the trachea and bronchi is increased in proportion to the active alveolar surface. The "bailing out" of the alveoli must be increased over the normal if there is to be compensation for the respiratory embarrassment due to the pneumothorax.

Immediately after the pleural cannula is opened the animal is seized with intense dyspnoea. Two methods were used to study the changes produced in the minute volume of respiration. The results obtained were practically the same. Both methods showed the minute volume to be decreased during pneumothorax even though the respiratory movements were so marked that the volume of air respired per minute seemed to be increased.

The study of the respiratory gas exchange indicated that there is a constant reduction of the respiratory quotient during periods of pneumothorax which seems to be due chiefly to a fall in the output of carbon dioxide. The changes in the consumption of oxygen are more variable in direction, and seem not so intimately associated with the changes in the respiratory quotient. As the ventilation of the pulmonary alveoli decreases, the tension of carbon dioxide rises and that of the oxygen falls. In pneumothorax the blood may be assumed to be exposed as if *in vitro* to an increased tension of carbon

dioxide and a decreased tension of oxygen. The absolute amount of oxygen absorbed varies in either direction, depending on the metabolic demands of the animal, while the carbon dioxide production varies with the oxygen consumption, its elimination being always, at least relatively, and probably absolutely, reduced. The respiratory quotient is invariably decreased.

The carbon dioxide content of the blood is higher during the pneumothorax period than in the normal control period or the period of closed thorax after the pneumothorax. As regards the acid base equilibrium of the blood, it is concluded that an acidosis appears during pneumothorax. This is associated with, and in large part is due to, a retention of carbon dioxide. The rôle of fixed acid is not known.

The clinical application of these experiments may be applied to the operation for empyema on man. Patients may die during an operation for empyema because of the entrance of pus into a bronchus, with flooding of the lungs; because of stimulation of the vagus (reflex), especially when the pleural cavity is washed out (Capps and Lewis); or because of a condition suggested as possible by the experiments here reported. This refers to cases in which the patient has been rolled over and the thorax well drained of pus—cases in which a large open tube has been placed in the chest opening and covered with dry gauze dressing. Such cases have all the conditions of an open pneumothorax. The reason why the mortality has not been greater under such circumstances is possibly that unless the empyema is in the early stages, the mediastinum is stiffened by the inflammatory exudate and invasion so that the lung on the sound side is better able to meet the conditions and if the pus has not been too thoroughly emptied at the time of operation, it fills the tube, saturates the dressings and thus prevents the free exchange of air through the tube. Under such conditions clamping the tube will at times relieve a serious condition.

As the result of his work the author suggests the following procedures:

1. In early cases the aspiration of the pus through a needle for a few days in order to allow time for the stiffening of the mediastinum.
2. The use of local anaesthesia instead of general anaesthesia. General anaesthesia, by lowering the activity of the respiratory center, tends to augment the danger.
3. Closer observation of the patient for the first few hours after operation.
4. The incomplete removal of pus at the operating table.
5. The temporary application of a Politzer bag to the drainage tube to prevent the formation of a sucking wound and to drain the pus.
6. The use of negative pressure.

Details of the author's experiments, several tables, and numerous tracings supplement the text.

I. W. BACH.



**Davis, L.: The Morelli Method of Aspiration Drainage for Acute Empyema.** *Ann. Surg.*, 1920, lxxii, 327.

For many years surgeons operating for acute empyema have striven to obtain air-tight suction drainage of the chest as they recognized its importance and value in securing early re-expansion of the lung and hence in bringing about prompt functional cure.

Morelli has devised a pneumatic jacketed drainage tube which, on inflation of the dumbbell-shaped soft rubber jacket, closes the thoracotomy wound hermetically tight. This will remain tight for many days, is easily kept in place, and can be readily readjusted if for any reason the drainage is not satisfactory. It is held firmly in place by means of a spider of thin malleable metal which fits over the pneumatic sac and the feet of which are adjusted to the chest wall. The drainage tube is passed through a central opening in the spider which is of slightly smaller caliber. The whole is covered with a layer of gauze and fastened by strips of adhesive.

Preliminary thoracentesis is performed as follows:

The diagnosis of empyema having been made, the purulent exudate is withdrawn and replaced with an equal quantity of air by means of an apparatus consisting principally of a liter bottle and a syringe of a capacity of at least 100 ccm. with a perfectly fitting piston. The bottle is closed with a rubber stopper perforated by two glass tubes. One of these tubes is connected by rubber tubing to the thoracentesis needle, and the other with a three-way cock which in turn is connected with a filter consisting of a glass tube filled with sterile cotton and then with the syringe.

Having been sterilized and tightened, the large thoracentesis needle is introduced into the chest and, with the connection between the bottle and the syringe open, a suction stroke is made with the piston of the syringe. This produces a rarefaction of the air contained in the bottle and causes the fluid in the chest to flow into the bottle to replace the displaced air. When the flow of the fluid begins to subside, a reverse stroke is made with the piston of the syringe, forcing the air in it back into the bottle, whence, its place having been taken by the fluid, it is obliged to pass on into the pleural cavity. This is repeated until all the fluid has been evacuated from the chest.

Morelli advocates this method of thoracentesis for all pleural transudates and exudates of whatever nature, claiming that there is much less likelihood of a re-accumulation of the fluid than when aspiration is done by the ordinary method which greatly increases the negative pressure of the pleural cavity.

The pus of the empyema having been replaced with an equal amount of air, a thoracotomy with resection of a square piece of rib is done on the following day under local anaesthesia and the pneumatic drainage tube described is inserted in a bottle in the usual way for negative-pressure drainage. In addition, a bottle of Dakin's solution may

be connected to the tube at an elevation for frequent flushing of the cavity.

The value of irrigation with Dakin's solution or some other antiseptic in empyema is now generally recognized. Apart from its antiseptic value it is of special importance because it keeps the tubes free from plugging in cases of air-tight suction drainage.

In brief, the features of the Forlanini-Morelli method in the treatment of empyema are the systematic induction of pneumothorax, continuous aspiration drainage combined with irrigation, and the use of an air-tight pneumatic jacketed drainage tube which is of great value in appropriate cases.

H. A. MCKNIGHT.

**Tuffier, T.: The Treatment of Chronic Empyema.** *Ann. Surg.*, 1920, lxxii, 266.

The incidence of chronic empyema has decreased materially as our knowledge of the treatment of the acute condition has become better.

Exploratory puncture to determine the bacteriological nature of the effusion and repeated puncture to evacuate the residuum are carried out early. If these procedures are unsuccessful or if fluid remains, thoracotomy under local anaesthesia is performed in the posterior axillary line. Drainage by siphonage may be instituted or the effusions may be evacuated and the pleura disinfected with Dakin's solution. If this treatment also is unsuccessful, extensive thoracotomy and pleuroscopy under anaesthesia should be carried out with disinfection by the Carrel-Dakin method. When cultures are negative and drainage is absent, complete closure of the surgical orifice is indicated. In this manner a pyothorax is converted into an aseptic pneumothorax which is eliminated by bringing the parietal and visceral pleural together.

The author believes that in five of seven fatal cases treated by immediate thoracotomy death was due to a generalized infection of which the effusion was merely a part. Four cases of acute empyema became chronic because of pleural diverticula and bronchopleural fistulae in which disinfection was impossible.

Treatment of chronic empyemata should be preceded by methodical exploration of the cavity by means of radioscopy and pleuroscopy, the extent and form of the involvement and the mobility of the lungs during expiration and inspiration being noted. The result of the examination determines the applicability of one of two methods: namely, disinfection of the cavity and respiratory exercises, or closure of the surgical wound by the method of Depage and Tuffier.

Surgical exploration reveals three types of pathologic conditions: (1) a fistulous tract, sometimes very long, extending from the base of the thorax to the upper ribs; (2) a regular cavity with considerable retraction of the lung, always difficult to cure; and (3) a fissured cavity, narrow and long, directed downward and backward, lined by diverticula-forming pockets, and bilobar or multilobar.



Disinfection of the cavity by the Carrel-Dakin method is preferable except when a bronchopleural fistula is present. A tampon placed against the bronchial orifice may be sufficient to allow disinfection. If this is unsuccessful Tuffier resorts to continuous or interrupted oxygen aeration of all recesses in the cavity. Closure must be delayed until the culture reads zero and the pleura does not secrete pus. The parietal orifice may then be closed with no further concern regarding the cavity (Depage-Tuffier) or a pleuropulmonary decortication may be performed. If the former is done under local anaesthesia the edges of the orifice are resected throughout, hæmostasis is controlled perfectly, and closure is made by means of deep silkworm sutures. In old, obstinate cases with cavities which are indurated and not reducible by aspiration, thoracotomy with wide exploration followed by complete or incomplete, total or partial decortication is done. If oozing occurs, drainage is carried out for twenty-four hours and the wound then sutured completely.

In eleven cases it was necessary to re-open the wound because of secondary suppuration, although the cavity was much reduced in size. In two instances the wound was opened twice, but a cure was obtained ultimately. Two other wounds were re-opened, one because of an osseous fistula, the other because of hæmoptysis.

Slight thoracic deformity was noted in nine cases and considerable deformity in a case of seven months' duration.

A. C. JOHNSON.

**Hedblom, C. A.: The Treatment of Chronic Empyema.** *Ann. Surg.*, 1920, lxxii, 288.

In this paper the author gives a comprehensive historical review of empyema, discusses the general principles of treatment, and presents a study of 150 cases of chronic empyema treated at the Mayo Clinic during a little more than two years. An extensive bibliography of 193 references is appended to the article, which is profusely illustrated.

The minimum duration of the empyema in the patients treated was three months; the maximum duration twenty-three years. The process had been present for more than six months in 112 instances and more than one year in 65. Operation had been done elsewhere on 117 patients, many of whom had received surgical treatment several times. Fifteen lesions were definitely proved to be tuberculous. Thirteen patients gave a history of primary pleurisy with effusion; all of these had had open drainage treatment elsewhere.

Four methods of treatment were employed as follows: (1) simple rib resection, 42 cases; (2) Dakin's solution with or without minor drainage operations, 51 cases; (3) pulmonary decortication, 30 cases; and (4) plastic operation on the chest wall, 27 cases.

The first group for the most part includes patients who had had faulty drainage, although in some of these cases bronchial fistulæ were found and in

several there were foreign bodies in the cavities. Simple rib resection brought complete recovery in 26 cases; a persistent sinus at the last report in 4; and death in 1. Eight patients could not be traced. Of the tuberculous patients, 1 was greatly improved, 1 somewhat improved, and 1 not benefited.

The technique employed for the second group of patients, who were treated with Dakin's solution with or without a minor drainage operation for a small residual cavity, consisted in irrigation through a catheter inserted into the old sinus or through a stab wound by means of a trocar and cannula. The results were complete recovery, 34 cases; sinus at last report, 6; no late report, 6; convalescence not completed, 4; and no benefit, 1 (tuberculous).

In the cases of the patients who had a decortication, the operation was done under ether anaesthesia through a rib-spreading exposure. Fifteen patients were completely cured without further surgery, and 5 after a secondary plastic operation for a small residual cavity. Three had a persistent sinus at the last report; 1 died following the operation; 3 died from other causes some time later; and 3 are still under treatment.

The results of the plastic operations were a complete cure in 15 cases, a residual sinus at the last report in 3, and death in 2. Four patients had not completed their convalescence, and 3 could not be traced. Five patients were definitely proved to be tuberculous.

Small bronchial fistulæ were present in a considerable number of patients successfully treated with hypochlorite solution. Large bronchial fistulæ, 0.7 cm. or more in diameter, were present in 10. Four closed spontaneously following wide-open drainage of the cavity; 1 was closed by cauterization, 1 by suture, and 4 by a skin plastic operation. In 2 cases of tuberculous the fistulæ remained open. In 1 instance of multiple fistulæ in a case of bronchiectasis closure of only a part of the fistula was secured.

In 4 fatal cases 1 death was caused by sepsis and inanition following a rib resection for drainage, 1 by cerebral abscess following a plastic operation, 1 by tuberculous meningitis also following a plastic operation, and 1 by influenzal pneumonia following a decortication.

Hedblom closes the article with the following tentative conclusions:

1. Chronic empyema has been recognized and treated during twenty-six centuries, but it has been only sixty years since the first rib resection for drainage was done. The successive stages in the progress of treatment since that time are as follows:

a. Increasingly radical treatment, designed to obliterate the cavity by the collapse of the chest wall, involving successively more extensive operations, and culminating finally in a complete radical resection.

b. A conservative trend manifested primarily in the modifications of the complete resection, but



more in the attempt to preserve the chest wall and to restore the lung to its structural and functional relationships as first advocated by Delorme.

c. The adaptation of the Carrel-Dakin hypochlorite solution technique to the treatment of chronic empyema cavities.

2. Chronic empyema is a disease which is not incompatible with life nor with a fair degree of health and usefulness. The principles of treatment should therefore be, first, the preservation of life, and second, as far as possible, the conservation of function. Shortening convalescence, while very desirable, should always be a subsidiary consideration.

3. The choice of treatment must be made with cognizance of the variable etiology and pathology of the process and the general condition of the patient.

4. A major procedure is indicated only if non-operative or less extensive surgical treatment may be reasonably considered less effective.

5. In case of sinuses and small cavities, adequate drainage is usually sufficient to effect a cure with or without brief preliminary treatment with hypochlorite solution. It is at least open to question whether a radical operation is indicated in these cases for the sole purpose of shortening the convalescence at the risk of an appreciably increased mortality.

6. Dakin's hypochlorite solution treatment is the method of choice in the treatment of the ordinary type of chronic empyema cavity of any size, for the following reasons:

a. The general condition of the patient is, as a rule, improved to a remarkable degree.

b. The cavity may be obliterated or greatly reduced in capacity by the liberation and expansion of the lung resulting from the treatment.

c. If the lung expands in part the extent of a later operation will be proportionately reduced.

d. If the lung entirely fails to expand, the cavity will have become relatively sterile in preparation for operation, thereby lowering postoperative morbidity and mortality.

e. Pulmonary decortication will be materially facilitated in some cases because of the softening action of the solution on the visceral pleura.

7. A pulmonary decortication through a rib-spreading exposure after preliminary irrigation with hypochlorite solution is the most conservative treatment for cavities that are not obliterated by drainage or Dakin's solution treatment alone. If such an operation is successful, the lung is restored to its normal structural and functional relationship and the cavity is thereby eliminated. If the operation is only partly successful, the magnitude of a secondary destructive operation is proportionately decreased.

8. Since before operation it is impossible to judge with certainty regarding the relative expansibility of the lung in every recent non-tuberculous case, a decortication should be done rather than a de-

structive operation so that the patient may be given the benefit of the doubt.

9. If the lung does not expand, or if a considerable cavity persists following decortication, a plastic operation is indicated.

10. If the cavity is of considerable extent or the patient is debilitated, a two- or three-stage plastic operation is to be recommended.

11. The recognition of tuberculous empyema is often difficult. A history of a primary pleurisy with effusion seems more often to signify a tuberculous condition than does a pulmonary lesion, unless the latter is active and extensive. A tuberculous empyema may be present in the absence of clinical or X-ray evidence of pulmonary involvement. The typical microscopic picture in the sectioned pleura or the demonstration of the bacilli in the exudate may constitute the only evidence in such cases.

12. A tuberculous empyema not secondarily infected should not be drained, and should be aspirated only for a considerable accumulation of fluid. For a tuberculous empyema secondarily infected, either by operation or spontaneously, drainage is necessary.

13. In the absence of bronchial fistulae and of bleeding, secondarily infected tuberculous empyema may be markedly benefited by antiseptic solution treatment. The amount of fibrosis or other pathologic change in the lung in such cases determines the degree of expansion of the lung, whether following antiseptic solution treatment or decortication.

14. If the lung fails to expand in whole or in large part, a several-stage operation designed to collapse the chest wall is indicated. Tuberculous patients are relatively poor operative risks.

15. Adequate drainage is the first indication in cases of empyema cavities which are draining through large bronchial fistulae. The fistulae may be obliterated spontaneously following such treatment.

16. Operative closure of bronchial fistulae that persist is necessary for complete healing. It may be accomplished by decortication of the involved portion of the lung with the cautery, suture, or skin plastic to cover the opening of the fistula. Occasionally healing results from simple granulation of surrounding tissue after destruction of the epithelial lining of the bronchial stoma.

17. Closing the bronchus which is draining pus from within the lung may result in a secondary lung abscess.

18. A large bronchial fistula is a contra-indication to treatment with Dakin's solution.

19. Sinuses of variable duration are common following more or less complete obliteration of empyema cavities. A large proportion eventually are obliterated without radical treatment. For those which persist, plastic operation is indicated.

20. Operative mortality in chronic empyema has been due largely to shock and infection. Reduction of the extent of operation and preliminary sterilization will materially lower this mortality.



Adams, J. E.: *Lumps in the Breast. Practitioner*, 1920, cv, 166.

Adams considered the treatment of "lumps" in the breast from three points of view: (1) cases which must be operated on without delay; (2) cases in which surgical delay is permissible or non-operative treatment is desirable; and (3) the scope of the operation.

Under the first heading he includes all cases of malignant disease and all tumors suspected to be malignant, except those which must be classed as inoperable.

A complete operation should be performed when it appears that all obvious malignancy can be removed and the patient is able to stand an extensive operation. A palliative operation may be done to reduce the risk of the formation of a painful malignant ulcer, but it is not worth while to do any operation in malignant disease unless the whole breast can be removed and the adjacent axilla cleared of its glands.

Non-malignant lumps include abscesses. These must be opened to drain the pus. The incision should be in a direction radiating away from the nipple. The septa of multilocular abscesses should be broken down with the finger and tube drainage established in the lowest part of the abscess cavity. Adenomata may be enucleated. Cysts should not be treated by puncture or aspiration but removed. In localized mastitis operative treatment is called for if the lesion does not yield to local applications after a trial of three or four weeks. Occasionally these small masses disappear as the result of treatment with hot dressings or local gentle friction with a liniment of atropine or iodox, but the diagnosis in such cases is by no means certain and for this reason it is dangerous to postpone surgical measures.

In diffuse mastitis the decision may be even more difficult, but there are two factors which should influence one to urge operative treatment rather than palliative measures. Chronic interstitial mastitis is often the precursor of cancer; therefore, if one wishes to cure cancer of the breast, he should arrest it still-born and non-malignant. The second factor is the age of most patients with this condition. The majority are over 40 years old and therefore, as a functioning gland, the breast has ceased to be of much value. Hence amputation of the whole breast is called for rather than mere local excision.

The author divides cases in which surgical delay is permissible or non-operative treatment is desirable into two groups and considers the second group first. Under non-operative treatment he includes radiotherapy, local applications to the breast, and the use of drugs. As to the last, he states that it is doubtful whether any drug exerts much influence on the activity of the breast, but that if a syphilitic lesion is diagnosed, it is amenable to modern therapeutic remedies, and both arsenical preparations and mercury should be employed.

Topical applications to the breast consist mainly of hot dressings for the relief of congestion in sub-

acute mastitis and in some forms of lobar mastitis. These are applied with the firm pressure of a bandage, and doubtless the pressure and support have a beneficial effect, especially on a breast in the lactating stage. Puerperal mastitis, and even a threatened abscess, may be aborted by taking the child away from the breast, drawing off the milk with a breast pump, and supporting the gland with a firm bandage.

Radiotherapy has been used as an adjunct to surgery as well as a substitute for operation. The author believes that radium inserted into a tumor of the breast sometimes causes shrinkage of the tumor mass, but he has never seen a cure effected by this method of treatment. He believes the X-ray is more successful as radium is essentially local in its action and does not possess the penetrating power of the roentgen ray. In cases in which operation is contra-indicated and those in which there is recurrence in deep tissues the X-ray affords some prospect of amelioration of the condition; malignant ulcers may heal under its influence, pain may be lessened, and deposits in the glands may shrink.

X-ray treatment has been advocated also for chronic mastitis but, while cures have been reported, the author feels that it is a rather dangerous method of treatment because we are often uncertain of the diagnosis and the precise action of the rays on the tissue-cells is not entirely under control so that, in the endeavor to induce resolution, unstable cells may be stimulated into malignant activity.

Cases in which it may be desirable to postpone operation for a short period of time include only a very small number of cases of malignant tumor. The period of delay must necessarily be short. If it is certain that the lump is not malignant, delay will not alter the prognosis appreciably. If there is doubt as to whether the lump is inflammatory, cystic, or malignant, the sooner the diagnosis is cleared up the better. In such cases the aid of the microscope will probably be required and therefore the removal of a piece of tissue. If the patient is over 40 years of age it is best to obtain her permission to remove the whole breast; if she is younger, the removal of a wedge-shaped portion may be sufficient.

In the operation for malignant disease of the breast it is better to remove too much rather than too little. There are four degrees of removal: (1) complete amputation with the removal of the pectoral muscles and clearance of the axillary glands; (2) amputation of breast with the nipple and covering skin; (3) excision of the breast, leaving the skin and nipple; and (4) excision of a wedge-shaped portion of the breast.

Amputation of the breast, leaving the pectorals and axillary glands, is called for in diffuse mastitis, in cases of simple neoplasms involving most of the breast, and occasionally in malignant disease to rid the patient of a malignant ulcer.



In the radical operation the author makes the skin incision in the shape of a racquet with two handles, an upper and a lower, so as to open up the superficial fascia and allow that which is to be left behind to be raised up to the clavicle, inward to the sternum, and as far back as the posterior axillary fold. At the upper part the insertion of the pectoralis major should be defined, while at the lower limit the upper part of the rectus sheath should be raised from the muscle. The axilla is most easily opened by division of the fibers of the pectoralis major close to its insertion and then close to the clavicle. This exposes the costocoracoid membrane, the pectoralis minor, and the axillary vein. The former structures are removed and the vein is laid bare. The lymphatics, as far as the under-aspect of the clavicle, are freed, and the fascial covering of the latissimus dorsi and the serratus magnus is dissected up from the back of the axilla.

One of the advantages of extensive removal of fascia is that the skin flaps more readily slide together. Tension stitches are rarely necessary. Hemostasis must be carefully attended to at the operation, and the axilla must be drained of blood and serum for the first forty-eight hours after operation. The author ties a large glass Kocher tube through the upper part of the skin incision to drain the axilla, and places a smaller one in the lower part of the incision. Until these are removed, between thirty-six and forty-eight hours after the operation, it is well to bandage the arm to the side. After the first dressing and the removal of the tubes, the arm may be supported in a sling. Active movements of the hand are encouraged from the first, free movements of the forearm are allowed after the tubes are out, and movement of the upper arm after the fifth or sixth day.

The patient should be examined after the operation regularly at monthly intervals.

G. W. HOCHREIN.

### TRACHEA AND LUNGS

**Hartwell, J. A.: Abscess of the Lung.** *Ann. Surg.*, 1920, lxxii, 333.

An abscess of the lung is a collection of pus within the destroyed lung parenchyma; that is, outside the lumen of the respiratory tree. Surrounding the abscess, really a portion of its wall, there is often a zone in which the lung tissue is destroyed. This zone may be somewhat massive and the condition may approach gangrene.

While abscesses of the lung may result from other causes, the great majority have as a direct antecedent some type of aspiration inflammation. Abscesses are encountered clinically following all types of pneumonia, but as a rule a secondary invader, such as a staphylococcus or streptococcus alone or in association with the influenza bacillus is found.

In every case of abscess there is an exit for the fluid pus through the vesicles and small bronchioles. This drainage, however, is often inadequate, and

following the law of all suppurations, the process extends along the line of least resistance. Ultimately a large bronchus is opened to it, drainage is free, and the complete pathologic picture of abscess is presented.

An abscess in the more superficial parts of the lung tends to reach a considerable size before it approaches a bronchus with a lumen of sufficient size to afford adequate drainage. In the deeper parts of the lung such bronchi are more numerous and drainage is more complete.

When an abscess of considerable size develops in the superficial part of the lung and fails to reach a bronchus of size, there is no expectoration of pus. In its extension it finally arrives at the pleural surface, ruptures through, and produces a secondary empyema. The physical signs of the empyema then completely mask the abscess, and the case appears as a case of empyema only. The abscess extends also, however, toward the deeper portion of the lung so that ultimately a large bronchus is reached and free expectoration of pus results. This is interpreted as the "rupture of an empyema" into the lung.

H. A. MCKNIGHT.

**Whittemore, W.: Lung Abscess from a Practical Point of View.** *Surg., Gynec. & Obst.*, 1920, xxxi, 144.

Although medical books give lobar pneumonia as the most common cause of lung abscess, the author has found it to be seldom if ever responsible. The most common etiological factor in Whittemore's cases was the aspiration of blood or infected matter during or following operations on the nose and throat and the extraction of teeth. The next most frequent cause was bronchopneumonia. In rare cases the abscess was due to a septic embolus.

The three most common conditions which must be considered in the differential diagnosis are lung abscess, bronchiectasis, and a small encapsulated or interlobar empyema. The prognosis of these conditions is very different. If a small encapsulated empyema is drained the outlook for cure is very good, while if a lung abscess is drained the prognosis as regards a permanent cure is only fairly good. In bronchiectasis drainage offers absolutely no hope of cure.

Four essentials in the diagnosis are a carefully taken history, a sputum examination, an X-ray examination, and a physical examination.

There are certain cases in which almost any one can obtain the history. These are the cases in which the condition has followed aspiration. The difficult cases, however, are those in which there has been some lung infection three or four or even more months previous to the patient's admission to the hospital. For instance, a history may be given which goes consistently with a sudden pneumococcus infection and might tend to throw evidence toward an encapsulated empyema which had been unrecognized and untreated until it suddenly broke through into the lung and bronchus. Or the history



may be consistent with an influenza bacillus infection of the lung and this would tend toward a bronchiectatic condition.

To rule out tuberculosis many examinations of the sputum are necessary. The finding of fibers points in all probability to a lung abscess. The presence of a large number of influenza bacilli indicates bronchiectasis.

The X-ray examination is important as in many cases it not only reveals the nature of the condition definitely, but also very clearly indicates the situation of the process. If the X-ray shows a definite cavity with a fluid level in it, the condition is doubtless lung abscess, but if it shows a definite shadow but no fluid level, the condition may be a persistent unresolved pneumonia or a small localized bronchiectasis.

While occasionally all the classical signs are present, such cases are rare. In some instances only a little dullness or a few râles or both are noted. In one of the author's cases nothing was discovered during the physical examination although a lung abscess was found at operation.

While between 6 and 10 out of every 100 cases of lung abscess will become cured spontaneously there is danger of brain abscess or a general septicæmia or pyæmia unless operative treatment is given. As a rule the author operates on all cases of lung abscess. Whittemore condemns the practice of inserting needles through the chest wall before operation for diagnostic purposes as he believes that in such a procedure there is great danger of empyema, pneumothorax, or puncture of a large vein in the lung with resulting hæmorrhage which may cause death.

The operation recommended is the two-stage operation. In the first stage a window is opened down to the pleura and if the lung, and the costal pleura are not adherent, adhesion is brought about by packing a gauze sponge against the pleura and leaving it in place for two or three days. In the second stage, which may be done safely two or three days after the first stage, the abscess is opened through the small area where the lung and the pleura are adherent, and drainage is effected by means of a soft rubber tube with a cigarette wick to the pleura.

CARL H. DAVIS.

**Eggers, C.: The Treatment of Bronchial Fistulae.**  
*Ann. Surg.*, 1920, lxxii, 345.

Six cases of bronchocutaneous fistula are reported. A bronchial fistula is a communication between the bronchus and the outer surface of the lung. Etiologically such fistulae are divided into: (1) those due to intrapulmonary suppuration such as lung abscess or bronchiectasis; and (2) those due to external violence such as gunshot wounds and war injuries. A lung abscess may rupture spontaneously, in which case usually a bronchopleural fistula develops, or if operated upon, a bronchocutaneous fistula. Anatomically, bronchocutaneous fistulae are divided into: (1) bronchopleural fistulae which Eggers believes are much less commonly associated with

empyema than they are generally supposed to be, and (2) bronchocutaneous fistulae which are due usually to operative interference in cases of lung abscess or to gunshot wounds.

The treatment of bronchopleural fistulae associated with empyema either acute or chronic is usually that of the primary condition. The fistula itself does not require special treatment.

The treatment of bronchocutaneous fistulae depends upon their etiology and duration and other special points. If the fistula is a safety valve for pus from an intrapulmonary focus, it must not be interfered with except that in long-standing suppuration such causes as a lobulated cavity or a sinus too narrow to carry off the secretions should be corrected. In the few cases which persist after suppuration has ceased the operative procedures must be directed against the two common causes: (1) a rigid outlet at the chest wall preventing collapse and union of its walls, and (2) epithelialization of the entire tract.

In the operative descriptions emphasis is placed on the importance of: (1) treatment of the primary cause if it persists, (2) excision of the fistulous margins and mobilization of the lung, (3) light cauterization of the tract, and (4) in some cases suture of the outer opening of the fistula and drainage. Muscle flaps are useful to cover the bronchial sinus after the necessary preparation. If the fistula is due to a lung abscess and there is danger of damming back secretions and the development of pneumonia, the bronchus should not be sutured. Instead, a muscle flap should be simply laid over it and drainage facilitated. Whenever possible, local anæsthesia should be used.

H. J. VANDEN BERG.

## HEART AND VASCULAR SYSTEM

**Costantini, H.: The Surgical Treatment of Heart Wounds** (*Du traitement chirurgical des plaies du coeur*). *J. de chir.*, 1920, xvi, 383.

Costantini has collected the statistics of 287 cases of injuries of the heart due to projectiles or cutting instruments in which there were 141 recoveries following operation. He believes that every wound of the heart should be operated upon immediately even though such an injury may recover spontaneously.

Reviewing the surgical methods of approaching the heart the author states that no method should be selected which does not spare the pleura. While the immediate danger is danger to the heart, the late danger is infection of the pleura.

When the symptoms and examination have clearly established the presence of a heart wound the heart should be approached by sectioning a flap including the third, fourth, and fifth cartilages on the left side and, if necessary, resecting the left sternal border. When the presence of a heart lesion is doubtful an exploration should first be made through a transverse incision.

In the thoraco-phreno-laparotomy advocated by Duval and Barnsby accidental opening of the pleura



is to be feared, especially during the separation of the sternal ends.

In cardiorrhaphy the method of choice to arrest hæmorrhage is digital obliteration of the wound, but the surgeon must see clearly and the operative opening must be ample. As far as possible, sutures of the heart should be non-perforating.

The statistics collected by the author show that the mortality of operations on heart wounds is approximately 50 per cent. In 221 cases of ventricular wounds there were 118 deaths (mortality 53 per cent), while in 36 cases of auricular wounds there were 14 deaths (mortality 38 per cent).

Of 221 ventricular wounds 119 were wounds of the left ventricle (mortality 55 per cent), and 102 wounds of the right ventricle (mortality 52 per cent).

In 213 cases of knife wounds of the heart there were 111 deaths (mortality 52 per cent), while in 74 cases of wounds due to projectiles the mortality was 47 per cent. In 13 cases in which there was an associated abdominal wound 10 deaths occurred, while in 27 cases in which there was an associated wound of the lung there were 19 deaths.

In 128 cases in which hæmopericardium was the chief complication the mortality was 38 per cent; in 48 cases in which the chief complication was hæmothorax the mortality was 57 per cent; and in 63 cases in which both hæmothorax and hæmopericardium were present there were 45 deaths.

In conclusion Costantini states that certain wounds of the heart, like certain wounds of the arteries, may be dry wounds. W. A. BRENNAN.

### PHARYNX AND ŒSOPHAGUS

**Bohmansson, G.: An Antethoracal-Œsophageal Plastic Operation.** *Acta chir. Scand.*, 1920, liii, 91.

Any impermeable Œsophageal stricture which cannot be dilated or upon which an endo-Œsophageal operation is impossible presents an indication for a plastic Œsophageal operation. However, because of the long time necessary to complete the operation and the difficulties and risks encountered, this procedure is advisable only in non-malignant cases or malignant cases in which the X-ray or radium have effected or are effecting a cure.

An attempt should be made always to establish a sufficient opening by probing. According to von Haecker, direct or even retrograde probing should be carried out most conscientiously. Although a gastrostomy will keep the patient alive for a long time it is an unsatisfactory procedure and the patient is a confirmed invalid as the lack of psychic stimulation greatly impairs his digestive powers.

The author reports the case of a man 38 years of age, who, at Christmas time, 1918, drank a wineglassful of strong polishing lye. He recovered from the immediate effects, left the hospital in fair condition, but re-entered it in February, 1919, because of difficulty in swallowing. He was then able to take only liquids and at times had difficulty in swallowing these. In March a gastrostomy—Witzel

fistula method—was performed. The patient was fed through the fistula until May when, after gaining 6.4 kg., he was subjected to a second operation.

Through a median incision a loop of jejunum about 30 cm. long was detached with its blood supply and the distal end was implanted into the stomach near the lesser curvature while the proximal end was kept closed and threaded under the skin of the thorax so that it emerged just below the second rib to the left of the sternum. The severed parts of the intestine were united by means of a lateral anastomosis. The object in leaving the upper end of the intestinal transplant closed was to prevent infection. The lower end was implanted into the stomach immediately to allow for drainage. The advantage of the implantation at the lesser curvature was that the danger of kinking or looping was diminished. Lexer, Bornhaupt, and others have divided this procedure into two stages, first separating the loop and re-uniting the intestine, and then transplanting the loop and performing the entero-gastrostomy. In June, 1919, in the case reported an Œsophageal fistula was established in the neck. This was followed by a rather stormy convalescence and the next operation was not done until October. In the meantime the skin of the chest was epilated by means of the X-ray.

At the next sitting a skin tube was made by incising the skin in two parallel lines extending from the Œsophageal fistula above to the wound under the second rib where the proximal end of the transplanted intestine was anchored, undermining the edges, and rolling the skin into a long hollow cylinder. The skin tube was then united carefully to the Œsophageal and intestinal openings. The tube and both openings were covered over with a large pedicled flap. Fistulæ formed at the lower end of the skin tube but finally healed. Two weeks after the last operation the patient began taking nourishment by mouth and from this date he improved rapidly. In February, 1920, the catheter was removed from the Witzel fistula and soon thereafter the gastrostomy opening closed spontaneously. A month later the patient was discharged in good health, having gained in all 13.2 kg. "He was able to take all kinds of nourishment but had to masticate coarse meat in order to swallow without hindrance."

The article is concluded with a very complete bibliography. R. B. BETTMAN.

### MISCELLANEOUS

**Heyd, C. G.: Thoraco-Abdominal Injuries: Some Technical Procedures Developed by the War.** *Ann. Surg.*, 1920, lxxii, 370.

Combined thoraco-abdominal injuries passing from side to side through either the right or the left hypochondriac region were relatively benign but the mortality was greater the nearer the track of the projectile approached the midline. When there was a fair-sized perforation of the diaphragm or a loss



of substance, herniation of the abdominal contents, most frequently of the omentum but also of the spleen, the stomach, and the transverse colon, was common. When the liver was injured the initial hemorrhage was severe but had stopped at the time of operation except in cases of fragmentation. The spleen showed a greater tendency toward fragmentation than the liver. Diaphragmatic injury always calls for suture for if it is left unrepaired death is the inevitable consequence. In diaphragmatic injuries which could not be exposed by enlarging the orifice of entry or exit, a thoracotomy with resection of from 6 to 8 in. of the sixth or seventh rib was done.

In some cases the opening was enlarged so that intra-abdominal complications could be dealt with, but when such enlargement was inadequate, a laparotomy was done also. In one case splenectomy was performed through the chest. No. 2 chromic catgut was used for diaphragmatic suture. In cases in

which there was loss of the marginal portion of the diaphragm it was relatively easy to suture the parietal portion of the diaphragm to the parietal pleura. The handling of the lung did not cause a marked fall in the blood pressure nor the same degree of shock as similar manipulation of the intestines.

Liver wounds were lightly débrided and some of those which were gutter shaped were sutured or covered with omentum. In cases of injury to the kidneys the shock and mortality were less when the posterior surgery was done before the laparotomy or thoracotomy.

War experiences suggest a wider technical application of major thoracotomy to lesions involving the diaphragm and the viscera immediately subadjacent to it, such as diaphragmatic hernia, lesions of the liver and the cardiac portion of the stomach, and certain lesions of the spleen.

H. J. VANDEN BERG.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Taylor, A. S.:** *The Results of Operations for Inguinal Hernia Performed in the Johns Hopkins Hospital from Jan. 1, 1899, to Jan. 1, 1918.* *Arch. Surg.*, 1920, i, 382.

The chief purposes of this investigation have been: (1) to determine the cause of recurrence or weakness in the wound following the various procedures used to cure the hernia, and (2) to determine the value of each feature of the operation.

From Jan. 1, 1899, to Jan. 1, 1918, there were performed in the Johns Hopkins Hospital 256 operations for direct, and 2,230 operations for indirect inguinal hernia. In July, 1918, letters were sent to all patients treated between these dates with the request that they present themselves for examination if possible, and if unable to do so, that they send a report regarding the local condition from their physician. The results have been ascertained in 910 cases.

Of 816 cases of indirect hernia, the results in 356 are known from examination in the hospital, and those in 460 cases from reports of a physician or the patient. In the 356 patients examined at the hospital, 30 recurrences were found. Of the 460 patients who responded by letter only 16 reported recurrence. As the percentage of recurrence in the patients examined by surgeons at the Johns Hopkins Hospital is more than twice as great as in those who reported by letter, the author believes that recurrences have been overlooked by the patients themselves or their examining physicians, and hence that the actual number of recurrences is greater than the figures indicate. In 770 cured cases the average time that had elapsed since operation was six years, and in 46 recurrent cases, forty-two months.

Of the patients operated on for direct hernia, 47 were subsequently examined at the hospital and found to be cured, and 30 reported a cure by letter. In these 77 cases the average time that had elapsed since operation was five years. In an examination at the hospital 14 recurrences were found, and 3 patients reported a recurrence by letter. The average period of recurrence in these direct cases was eight and six-tenths months after operation.

In attempting to determine the factors involved in the recurrence of an inguinal rupture the type of the hernia, the condition of the structures—especially of the conjoined tendon—the features of the operation, the healing of the wound, the age and sex of the patient, and the operator's technique have been taken into consideration.

In the course of this study a number of patients operated on previous to 1899 were seen incidentally. The results of these examinations are given in the following table:

EXAMINATION OF PATIENTS OPERATED ON PREVIOUS TO 1899

Time elapsed since operation	Number of patients	Time elapsed since operation	Number of patients
19 years	10	24 years	6
20 years	11	25 years	6
21 years	6	26 years	1
22 years	4	27 years	2
23 years	3		

Of 95 cases in which the veins were excised, hydrocele is known to have occurred in 19 (20 per cent).

Of 721 cases in which the veins were excised, hydrocele occurred in 28 (3.8 per cent). The correspondence of these figures with those of Bloodgood is striking.



Local anaesthesia was used in 50 of the operations for indirect hernia. A recurrence developed in 6 (12 per cent). Infection followed the use of local anaesthesia in 1 case (no recurrence). In this instance an infected suture was removed one year after the operation.

Infection of the wound occurred in 8 cases, and in these there were 2 recurrences (25 per cent). In 48 cases of indirect hernia with more or less completely obliterated conjoined tendon there were 18 recurrences (37.5 per cent). This is a greater percentage of recurrences than in cases of the direct variety in which the conjoined tendon was not obliterated. In the 48 cases of weak or partially obliterated conjoined tendon the cord was transplanted in 8, and in these 8 cases a recurrence developed in 2 (25 per cent). In one of these recurrent cases, the recurrence was found at the lower angle of the wound; the other patient was not seen subsequent to the operation and the exact situation of the recurrence, which was reported by letter, is not known.

In 22 cases in which the rectus muscle was transplanted there were 9 cases of recurrence (40.9 per cent).

A flap from the rectus fascia was transplanted in 13. In this series there were no recurrences.

The cord was transplanted in 19 cases, with 7 recurrences (36.8 per cent). The recurrence was found at the site of the transplanted cord in 3 cases and at the lower angle of the wound in 1. Its situation in 3 is unknown.

The cord was split and the veins alone transplanted in 44 cases. In these there were 8 recurrences (18.1 per cent). In 6 the recurrence was found at the site of the transplanted veins, and in 2 also at the site of the untransplanted vas deferens. Thus it appears that while the splitting of the cord did not reduce the percentage of recurrence it transferred its site.

The cord was excised in 21 cases in which there were no recurrences.

In 9 cases of undescended testicle with indirect hernia there was 1 recurrence (11.1 per cent). In the recurrent case the testicle had been replaced in the scrotum. In the other 8 cases castration had been performed in 4 instances, and the testicle had been replaced in the scrotum in 4.

In 11 cases of strangulated indirect hernia, 2 of which were drained, a recurrence developed in both of the drained cases. In the 9 undrained cases there were no recurrences.

Of the 87 cases in which the veins were not excised, hydrocele occurred in 2 (2.2 per cent), whereas in the 9 treated by excision of the veins hydrocele occurred in 7 (77.7 per cent).

Local anaesthesia was used in 11 operations for direct hernia. In this series there were 2 recurrences (18.1 per cent).

Infection occurred in 4 cases, and in 2 of these a recurrence developed (50 per cent). In 1 of the recurrent cases local anaesthesia was used.

There were 19 cases of direct hernia with a more or less completely obliterated conjoined tendon. Among these the number of recurrences was 6 (31.5 per cent). This is approximately the same percentage as that found in the indirect variety with obliterated conjoined tendon. In the 19 cases of weak or partially obliterated conjoined tendon the cord was transplanted in 9 and in these there were 3 recurrences (33.3 per cent). The recurrence was found at the inner angle of the wound in 1 instance, but in 2 its site is unknown.

In 12 cases in which the rectus muscle was transplanted there were 3 recurrences (25 per cent).

Transplantation of a flap from the rectus fascia in 3 cases was followed by a recurrence in 1 (33.3 per cent).

In 20 cases in which the cord was transplanted there were 5 (25 per cent). The recurrence was found both at the site of the transplanted cord and at the inner angle of the wound in 1 case, and at the inner angle of the wound in 1. Its situation in the others cannot be determined from the reports sent by letter.

In 3 cases in which the cord was split and the veins transplanted and in 4 cases in which the cord was excised there were no recurrences.

Following the 2,486 operations performed since 1899 there were 19 deaths in the hospital. Seven of these were due to strangulated hernia, 4 to pulmonary embolism, 1 to myocarditis, 2 to meningitis, 4 to pneumonia, and 1, that of an infant aged 17 months, to status lymphaticus. The total mortality was 0.76 per cent. Excluding the deaths due to strangulated hernia, it was 0.48 per cent.

E. C. ROBITSHEK.

## GASTRO-INTESTINAL TRACT

**Baurmann, K.: The Influence of War and War Rations on Surgical Diseases of the Alimentary Tract** (Hat der Krieg und seine Ernährung die chirurgischen Erkrankungen des Magendarmtraktes beeinflusst?). *Deutsche Ztschr. f. Chir.*, 1920, cliv, 41.

The following gastric and intestinal conditions were studied with regard to their frequency during war as compared with peace times: hæmorrhoids, gastroptosis, enteroptosis, ileus, malignancy, gastric and duodenal ulcer, appendicitis, herniæ, and diseases due to intestinal parasites.

Partial starvation is evidenced first by a decrease in the body fat followed by changes which, in the abdominal organs, consist of variations in the intestinal contents, motility, capacity, and secretion, and an effect exerted by psychic stimuli upon digestion. In the frequency of hæmorrhoids no variation was noted. The same was true also of tuberculous rectal fistulæ in spite of the fact that there was a marked increase in other surgical conditions due to tuberculosis. Prolapse of the rectum was more frequent during the war, as was also gastrop-tosis, though to a less degree. Ileus became more frequent especially in women, being due to the



fermentation of the foods rich in cellulose and carbohydrates, and the loss of fat.

The frequency of carcinoma of the gastro-intestinal tract varied little with the exception of cancer of the rectum which showed a definite decrease due, according to Baurmann, to the fact that chronic constipation was less frequent. Carcinoma of the intestine showed a slight decrease in the number of cases. In agreement with many of the earlier investigators, the author found also an increase in the incidence of gastric and duodenal ulcer but does not regard this as of much importance. Appendicitis, which occurs infrequently among people subsisting chiefly on a vegetable diet, was less frequent. Herniæ, on the other hand, were more frequent as a result of emaciation and its consequences; in such cases there was a greater tendency to incarceration and the development of gangrene. Parasitic diseases of the bowel were also observed more frequently; in peace times such diseases are rare.

KLEINSCHMIDT (Z).

**Goullioud: Hemigastrectomy in the Treatment of Bilocular Stomach** (De l'hémigastrectomie dans l'estomac biloculaire). *Presse méd.*, Par., 1920, xxvii, 566.

As applied to bilocular stomach the term "hemigastrectomy" means resection of the pyloric pocket. Goullioud prefers this term to "pylorogastrectomy."

Goullioud has performed a hemigastrectomy in four cases of bilocular stomach, the first in 1907. These were cases of mediogastric stenosis without concomitant pyloric stenosis. Examination of the first three patients six and twelve years after the operation showed that the gastric function still remained excellent. The operation in the fourth case was performed only recently.

Goullioud believes that the hemigastrectomy for bilocular stomach which he performed in 1907 was the first of its kind. Bérard reported an earlier case but in this instance the stenosis was complicated by cancer. In 1899 Budinger performed a similar operation in a case of pyloric and mediogastric stenosis.

In Goullioud's first three cases the patients were women and the operation was performed under local anæsthesia. Women bear the long operations of gastric surgery better than men and are less subject to pulmonary complications. Men should be operated upon under local or regional anæsthesia and the operation should be done in two stages, viz., entero-anastomosis on the cardiac pocket in the first stage and hemigastrectomy of the pyloric pocket after a suitable interval.

The technique of the removal of the pyloric pocket is similar to that of Péan's operation for cancer. The resection is begun either at the duodenum or above the mediogastric stricture after the stomach has been freed from its mesentery along its greater and lesser curvatures.

In 1904 Santy collected from the literature the reports of 20 cases of bilocular stomach treated by

pylorogastrectomy and 44 cases treated by mediogastric resection. The mortality in the former group was 20 per cent, while that in the latter was 13.6 per cent. The clinical end-results of pylorogastrectomy after long intervals were most satisfactory.

In recent years the operation of pylorogastrectomy or hemigastrectomy seems to have gained much ground. Pauchet and Délore in particular have published many case reports.

In conclusion Goullioud states that the present tendency to resect an ulcer makes mediogastric resection or hemigastrectomy the operation of choice in cases of bilocular stomach due to ulcer. Gastro-enterostomy is an operation of urgency and other methods are indicated only when a gastrectomy would be impossible or very difficult.

W. A. BRENNAN.

**Babcock, W. W.: The Control of Hyperchlorhydria and Its Consequences by Cholecystogastrotomy.** *Med. Rec.*, 1920, xcvi, 476.

In the normal process of digestion the pepsin in the stomach is combined with hydrochloric acid which is formed by the parietal cells in the prepyloric portion. The acidified pepsin, mixed with food is carried to the pyloric antrum, the area of the stomach subjected to the greatest irritation from the gastric juice. To protect the antrum from digestion an alkaline mucus is secreted by its mucous glands and at the completion of gastric digestion the pylorus relaxes and a reflux of bile and pancreatic juice into the stomach rests the antrum from the erosive chyme.

In the duodenum the acidified pepsin, if permitted a prolonged contact, might damage the intestinal mucosa, but such contact is prevented by the closure of the pylorus, which is produced reflexly on the entrance of the acid chyme into the duodenum and continues until the acid is neutralized by the bile and pancreatic juice.

Points on the mucosa where the protective mechanism is weakest are the predominant sites of peptic ulcers. Thus gastric ulcers are found chiefly on the upper and lateral walls of the antrum and duodenal ulcers on the upper wall of the first portion of the duodenum where the spurts of acid chyme through the pylorus first impinge and neutralization is most difficult. Therefore the author has come to the conclusion that as the peptic ulcer develops most frequently where there is most prolonged and intense hyperchlorhydria, as it rarely occurs on alkaline mucous surfaces, and as it heals when the acidity is overcome by admixture with the normal antacid bile, it is evident that acid pepsin is the most important single factor in the production of ulcer. Such being the case, it would seem that the surgical problem might be simplified by throwing the bile directly into the mucous areas which have proved unable to withstand the acid gastric juice and thus produce a continuous physiological neutralization of the affected mucosa. For cases of obstinate hyperchlorhydria Babcock suggests a



cholecystogastrostomy or what, in cases of ulcer, would be termed a "cholecysto-ulcer-ostomy" in which the gall-bladder would be anastomosed to the edges of the opening left after the excision of the ulcer. Bile in the stomach does not produce harmful symptoms as it normally enters the stomach after each meal and frequently is found in extracted test meals.

The author comments on a series of 27 cholecystogastrostomies and 15 cholecystoduodenostomies as follows:

1. No ill effects followed the operations.
2. In all cases of gall-bladder disease there was rapid and early convalescence.
3. In all ulcer cases the results were excellent, the symptoms being relieved. In one case of bleeding ulcer no hæmorrhage has been reported since the operation.
4. The operations are simpler and easier than gastro-enterostomy and may be performed with less exposure and manipulation of the abdominal contents.
5. A fairly large opening is made in the long axis of the stomach, the gall-bladder is sufficiently mobilized so that it can be brought to the desired part of the stomach, and the anastomosis is completed with two or three rows of No. 00 chromic catgut. As a rule, no drainage is used and the wound is tightly closed.
6. While hydrochloric acid has been found in the stomach contents in cases treated by the operations described, it was always less than normal and associated with a diminished total acidity.

In conclusion the author states that this article is merely a preliminary report on the operation and is made with the enthusiasm that comes with a somewhat limited and rather recent experience.

H. K. BEGG.

**Friedenwald, J., and Grove, G. H.: The Blood-Sugar Tolerance Test as an Aid in the Diagnosis of Gastro-Intestinal Cancer.** *Am. J. M. Sc.*, 1920, clx, 313.

It has been known for many years that a high blood-sugar content is usually observed in patients affected with carcinoma. From a study of 92 cases, including 32 of carcinoma of the gastro-intestinal tract as well as normal and non-malignant cases, the authors draw the following conclusions:

1. There is present in carcinoma of the gastro-intestinal tract usually a rather characteristic curve of sugar tolerance which differs somewhat from that observed in carcinoma in other regions of the body. The curve of this affection generally presents a high sugar content even in the fasting state, which is followed by an initial rise up to 0.24 per cent or higher within forty-five minutes after the ingestion of dextrose, remains at this level for at least one hundred and twenty minutes, and at no time during this period falls below 0.20 per cent.
2. The sugar tolerance test is rather distinctive, and therefore in a large proportion of cases may

render valuable assistance in the differential diagnosis between carcinoma and other diseases of the gastro-intestinal tract.

3. While opportunity has not been afforded to test a sufficient number of early cases of cancer of the stomach and intestines by this method and thus to establish the value of the test as a means of obtaining an early diagnosis, the fact that positive curves occur whether cachexia exists or not and whether the extent of the involvement is slight or great encourages the belief that the results may be quite definite even in the early stages of the disease.

4. While it is fully realized that the test is not specific and cannot be relied upon alone without consideration of the clinical aspects of the disease, and that there are cases of carcinoma in which negative findings occur and non-malignant conditions in which the results are positive, it is nevertheless apparent that, when properly performed, the blood-sugar tolerance test may be of considerable diagnostic help in obscure cases of carcinoma of the gastro-intestinal tract.

W. H. NADLER.

**Hunt, E. L.: Multiple Resections of the Small Intestine.** *Boston M. & S. J.*, 1920, clxxxiii, 275.

Twenty-one cases of multiple resection of the intestine were collected from the literature. Twelve of the patients died. Of 3 cases in which more than two segments were resected the author's case is the only one in which a cure was obtained.

The author's patient was an Italian male, 27 years of age, who was shot through the abdomen at close range with a large caliber revolver. Eleven perforations of the small intestine in two groups and another wound 18 in. above the ileocecal juncture nearly severing the bowel were found. There were also two considerable rents in the mesentery. Two resections, 21 and 13 in. in length respectively, were done, and a third shorter resection where the bowel was severely torn. Murphy buttons were used in each instance.

Sixty-six hours later an enterostomy was done just above the upper anastomosis because of distention and toxicity. On the thirty-fourth day the enterostomy was closed. The three Murphy buttons passed on the forty-third day and the patient left the hospital on the forty-eighth day.

The author draws the following conclusions:

1. In cases of severe traumatism to the intestine multiple resections are possible and should be done when a single resection would necessitate the removal of too great an extent of bowel.
2. When in such cases paralytic ileus has begun or is to be anticipated, a primary enterostomy proximal to the traumatized area is theoretically indicated.
3. In cases of postoperative ileus enterostomy should not be too long deferred. Its proven value entitles the patient to its benefits without waste of time on measures which are less efficient.

C. R. STEINKE



**Finsterer, H.: Arteriomesenteric Duodenal Occlusion and Acute Dilatation of the Stomach** (Arteriomesenterialer Duodenalverschluss und akute Magendilatation). *Deutsche Ztschr. f. Chir.*, 1920, cliv, 375.

The author reports five cases of arteriomesenteric occlusion of the duodenum and acute gastric dilatation which were not preceded by operation and discusses the pathogenesis of the condition. He enters especially into the differential diagnosis between arteriomesenteric occlusion of the duodenum and acute dilatation of the stomach. Like Haberer, he considers a change in the pulse after gastric lavage one of the most important points differentiating acute dilatation of the stomach from primary arteriomesenteric occlusion of the duodenum. While in dilatation of the stomach which is secondary to arteriomesenteric occlusion of the duodenum the pulse does not change either in quality or frequency after a gastric lavage, in the primary gastric dilatation considerable improvement in the pulse is noted. In many cases, nevertheless, a differential diagnosis between the two conditions is impossible.

In both arteriomesenteric occlusion of the duodenum and primary dilatation of the stomach gastric lavage and lying on the right side in the stomach and knee-chest positions are of first importance in the treatment. If these measures are not sufficient, operation is indicated. The operative prognosis in acute primary dilatation of the stomach is very uncertain as usually there is a central neuroparalysis.

BODE (Z).

**Richardson, E. P.: Acute Intestinal Obstruction: A Study of a Second Series of Cases from the Massachusetts General Hospital.** *Boston M. & S. J.*, 1920, clxxxiii, 288.

The cases studied are 118 cases treated at the Massachusetts General Hospital from 1908 to 1917 inclusive. Cases of acute mechanical obstruction in which operation was an immediate necessity are included but cases of chronic and partial obstruction and cases of strangulated external hernia are not considered. The fatalities of the series include deaths from any cause which occurred in the hospital.

Of the 114 patients operated upon, 67 were males and 47 females. Table I shows the results on the basis of the patient's age:

TABLE I.

Age	Cases	Recoveries	Deaths	Mortality Per cent
Under 1 year	11	3	8	72.7
1-10 years	6	5	1	16.6
11-20 "	25	18	7	28.0
21-30 "	15	13	2	13.3
31-40 "	27	12	15	55.5
41-50 "	10	6	4	40.0
51-60 "	11	5	6	54.5
61-70 "	9	4	5	55.5
71-76 "	3	2	1	33.3

Table II gives the mortality in relation to the cause of the obstruction:

TABLE II

Type of case	Cases	Recoveries	Deaths	Mortality Per cent
Early postoperative obstruction (first 4 weeks after operation).....	29	22	7	24.1
Late postoperative obstruction (developing after 4 weeks)...	28	17	11	39.3
Bands and adhesions without previous operation.....	14	7	7	50.0
Meckel's diverticulum.....	4	2	2	50.0
Volvulus.....	16	12	4	25.0
Intussusception.....	20	8	12	60.0
Mesenteric thrombosis.....	5	1	4	80.0
Congenital anomalies.....	..	..	..	..
Stone in gut.....	1	0	1	100.0
Internal hernia.....	1	0	1	100.0
TOTAL.....	118	69	49	41.5

Of the 60 patients without obstruction to the blood supply of the bowel, 42 recovered and 18 died. Of 34 with interference to the blood supply, 17 recovered and 17 died. The extreme distention of late acute obstruction produces marked interference with the circulation of the bowel wall through stasis and congestion but does not obstruct the circulation of the mesentery.

There was no marked variation in the mortality according to the level of the obstruction.

The type of anaesthesia and the results are given in Table III:

TABLE III

Anaesthesia	Cases	Recoveries	Deaths	Mortality Per cent
Ether.....	99	58	41	41.4
Spinal.....	7	6	1	14.4
Spinal and general.....	2	1	1	..
Local (novocaine).....	4	2	2	..
Novocaine and general.....	4	0	4	..
Gas oxygen.....	2	2	0	..
TOTAL.....	118	..	..	..

Next to the patient's age and the cause of the obstruction, the factors of greatest influence in the outcome of treatment were the promptness of diagnosis and operation, the type of anaesthesia and operation, the technique of the operation, and the after-care.

Improvement in the results lies in earlier diagnosis and operation. An average duration of time between the onset of symptoms and surgical treatment amounting to approximately three days cannot be considered satisfactory.

C. R. STEINKE.

**Holman, E.: End-to-End Anastomosis of the Intestine by Presection Sutures: An Experimental Study.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 300.

The authors summarize briefly principles deserving recognition in the development of intestinal suture as follows:



1. The necessity for an approximation of peritoneal or serous surfaces for a firm and permanent closure.

2. The necessity of including in the stitches a bit of the submucosa or fibrous coat of the bowel wall.

3. The importance of preventing soiling of the field of operation by intestinal contents or by handling of the mucous coat of the bowel.

4. The necessity, in end-to-end union, of maintaining the blood supply intact to the edge of the divided intestine. In Holman's opinion the fear of ischaemic necrosis of the in-turned portion due to pressure on the mesenteric vessels has been heretofore the greatest factor influencing surgeons against the end-to-end suture.

5. The importance of eliminating trauma.

The animals used in the experiments reported were dogs and cats. The form of end-to-end anastomosis effected is described as the "presection" type. All sutures were applied before the incision was made into the bowel, regardless of the amount of bowel to be resected. This was of value from the point of view of asepsis and from the standpoint of facility in suturing. All sutures were applied also without entering the lumen and without handling the septic mucosa at any time. The method was applied to the large bowel and used also in several end-to-end anastomoses in the caecum. The results were excellent.

The sutures were applied at right angles to the lumen of the bowel and therefore parallel to the large vessels coursing through the bowel wall. Accordingly, none of the larger vessels was constricted when the sutures were tied and, as shown by the injections, there was no impairment in the circulation to the severed ends of the various intestinal layers. Furthermore, the villi of the mucosa continued to function to the very edge of the divided bowel, and in no specimen was there any evidence of sloughing of the in-turned edges. Ideal and rapid healing at the point of union was thus provided for.

In the entire series there was no evidence of dilatation proximal to the anastomosis, a fact which indicated the absence of any obstructive narrowing of the lumen of the bowel. This being true for the intestine of the dog with its small lumen, Holman believes it would be true also for the intestine of the human subject with its larger lumen.

In the procedure described there is less trauma than when mechanical devices are used and the bowel edges are handled with forceps as in the plain end-to-end and Connell sutures, in all of which injury to the mucosa is quite unavoidable.

G. E. BEILBY.

**Hogan, E. P.:** Appendicitis Caused by Endamœba Histolytica, with Postoperative Amœbic-Ulcer Perforation of the Caecum. *J. Am. M. Ass.*, 1920, lxxv, 727.

In a careful review of the literature Hogan found little information on amœbic infections involving the

appendix. He quotes Musgrave who published an account of 50 fatal cases of intestinal amœbiasis without diarrhoea; Lenz who observed 1 case of appendicitis in amœbic dysentery; and Le Roy des Barres who reported 3 cases of appendicitis occurring in conjunction with, or following, amœbic dysentery. The author's case is unique in that it is complete both from a clinical and a pathologic standpoint as the patient was operated on for appendicitis and the pathologic examination revealed within the appendix a true inflammatory condition involving the mucous and submucous coats and the presence of the endamœba histolytica. The autopsy report is quoted as follows:

"The appearance of the caecum was striking. It presented numerous ulcers from 0.5 to 3 cm. in diameter, with soft, necrotic, overhanging walls and a central cavity filled with a yellowish or, at times, black, gelatinous material. The marginal intact mucosa was often extensively undermined, and neighboring ulcer cavities appeared in some cases to be connected by fistulous tracts extending laterally in the deeper levels of the wall beneath bridges of intact mucosa. The ulcerative process had involved the intestinal structures to varying depths. In many cases the inner muscular coat was exposed, and occasionally it appeared to have been invaded, or even destroyed, so that the serosa formed the floor of the ulcer, at least in part. \*\*\* No amœbæ were found outside the serosa.

"The appendix was markedly swollen, the cross-section of the fixed and dehydrated specimen measuring 1.2 cm. in diameter. There was a ragged area of ulceration involving about one quarter of the inner circumference of the walls and extending downward irregularly through the submucosa to the inner margins of the circular muscular layer. There were numerous smaller ulcers with a varying degree of destruction of epithelium and underlying tissues. Here the tendency was toward the production of a narrow ulcer cavity extending deeply into the mucosa and upper submucosa. The lumen of the appendix was filled with leucocytes, red cells, and cellular debris, mingled with which were considerable numbers of amœbæ. The amœbæ were found in the greatest numbers, however, immediately on the margins of the ulcer cavities. They were present also, sometimes in abundance, in the glandular crypts adjacent to the active ulcers; immediately beneath intact stretches of epithelium; and in the connective and lymphadenoid tissues in the immediate neighborhood of ulcer cavities. They often contained englobed red blood cells. The amœbæ were usually free in tissue spaces, but in many cases they appeared within the lumina of dilated lymph vessels. They appeared to excite no reactive inflammatory changes. The ulcer margins usually showed marked fibrin deposits. In the deepest part of the two largest cavities there was active polymorphonuclear exudation into the cavity and throughout the underlying tissue where the inflammatory process extended in a wide sector out-



ward to involve the muscular coat. Here, the intravascular and perivascular spaces often showed abundant polymorphonuclear leucocytes. The blood vessels were everywhere dilated and engorged, and there was frequent interstitial hæmorrhage. Small thrombi were frequent. The congestion and hæmorrhage became especially marked at the mesenteric attachment and in the mesenteric tissue itself. The serosa showed in some areas well-marked polymorphonuclear infiltration, and there was an exudate of fibrin and leucocytes on the peritoneal surface. \* \* \*

"The anatomical diagnosis was: amœbic colitis with perforation of a cæcal ulcer; abscess of the right iliac fossa and generalized acute peritonitis; amœbic abscesses of the liver; slight pulmonary congestion and œdema, with possibly early bronchopneumonia; chronic splenitis; old adhesive pleuritis and recent appendectomy." A. R. HOLLENDER.

**Falkenstein, L.: The Value of the Sondern Blood Picture in Appendicitis** (Ueber die Verwertung des Blutbildes nach Sondern bei Appendicitis). *Beitr. z. klin. Chir.*, 1920, cxix, 419.

Falkenstein studied the Sondern blood picture in 80 cases of acute appendicitis and 30 cases of chronic appendicitis and found the same results. The blood picture was a certain indication of the severity of the abdominal process and the reaction of the body toward it in every instance except in children under 5 years of age. According to Sondern, an increase in the percentage of polymorphonuclear neutrophils is an index of severe toxic absorption, and the grade of leucocytosis is an index of the resistance offered by the patient to this absorption.

In the evaluation of the blood picture both the leucocytosis and the percentage of polymorphonuclears must be taken into consideration. A slight increase in the percentage of polymorphonuclears points to a mild infection whereas a decided increase in their number indicates a severe infection. A slight increase in the polymorphonuclears with a slight leucocytosis means a mild infection with definite resistance. A definite increase in the number of polymorphonuclears with a decided leucocytosis means a severe infection and good resistance. A definite increase in the polymorphonuclears and a slight leucocytosis means a severe infection with poor resistance. A definite increase in the polymorphonuclears with no increase in the leucocytes means a severe infection and no resistance. An increasing number of polymorphonuclears with a diminishing number of leucocytes points to an increase in the severity of the infection and a decrease in the patient's resistance. A gradual decrease in the polymorphonuclears and a decreasing leucocytosis points to improvement. The greater the percentage of polymorphonuclears in relation to the leucocytosis, the greater the probability that pus is being formed.

Gibson devised a scheme by which the curves of the polymorphonuclears and leucocytes may be

plotted and their relation to each other may be clearly demonstrated. As normal, he considers 10,000 leucocytes and 75 per cent of polymorphonuclears. Bort (Z).

**Younge, G. H.: Three Years' Experience with Appendicectomy.** *J. Roy. Army Med. Corps, Lond.*, 1920, xxxv, 163.

In this article Younge reports a series of 180 cases of appendicitis operated on in the Military Hospital, Grantham, during a period of three years ending March 31, 1918.

The disease was more prevalent during February, March, July, and August, the admissions during these four months equaling 45.5 per cent of the total number. This fact led some of the medical staff of the hospital to conclude that the condition was in some way connected with the use of canned food. The prevalence during July and August would lend some support to this theory, but opposed to it was the prevalence during February and March, a period of the year when bacterial growth is presumably at a minimum.

In a large majority of the cases the symptoms were well marked and characteristic, so that there was rarely any difficulty in the diagnosis. In 21 per cent the appendix was more or less gangrenous, a condition which had supervened in from six to twenty-four hours from the first onset of the symptoms. Younge cites the case of a patient who fell ill on parade at 6:30 a.m. and about twenty minutes later was suddenly attacked by violent pain in the iliac region. He was at once taken to the hospital, less than a quarter of a mile distant, where he arrived in a state of collapse. Suitable restoratives were applied and an operation was performed as quickly as possible. The appendix was found to be completely gangrenous and death occurred at 3 p.m. from general peritonitis.

In 79 per cent of the cases acute inflammation was present. In 15 per cent the inflammatory changes were limited to the mucous lining of the appendix, while in 64 per cent they involved chiefly its peritoneal aspect. Definite fæcal concretions were found in 15 per cent. In a further 20 per cent the appendix contained liquid fæces. In not a single case was a foreign body discovered. A local abscess was present in 13 per cent of the cases. In 1 case an abscess was found in an adherent omentum, and in another, in the walls of the appendix.

The invariable rule was to operate with the least possible delay as soon as a diagnosis of acute appendicitis was established. Death occurred in 2 cases in which the patients at first refused to submit to an operation although the delay was only a matter of two or three hours.

In all cases except 1, the appendix was removed at the primary operation, even in the presence of an abscess. In the exception, the appendix, which was retrocæcal and retroperitoneal, was removed at a second operation as it could not be found at the first intervention when an abscess was drained.



In all the cases in which it was reasonable to assume from the signs and symptoms that there was no abscess and that the disease was still limited to the appendix, the McBurney (or McArthur) incision was used. The author believes that this is the incision of choice as it inflicts a minimum amount of damage on the muscles of the abdominal wall and therefore diminishes the risk of ventral hernia.

On the 180 cases, 3 terminated fatally. One of these has already been described. The second patient died within a few hours of the operation from general peritonitis, and the third was operated upon in the second twenty-four hours for acute appendicitis, but died on the fifth day after operation with symptoms of intestinal obstruction and toxæmia in spite of free intestinal drainage through an intestinal fistula.

Of the remaining 177, 2 were invalided from the service and 175 returned to duty. The author attributes the good results to: (1) the rule of operating with the least possible delay in every case of acute appendicitis; (2) the complete removal of the diseased appendix at the primary operation; and (3) the great care invariably paid to the peritoneal toilet.

G. W. HOCHREIN.

**Bevan, A. D.: An X-Ray Burn of the Anus.** *Surg. Clin. Chicago*, 1920, iv, 771.

This case is described by Bevan to illustrate the necessity for complete excision of pathologic tissue in the treatment of X-ray burns. The patient had been subjected to X-ray treatments for pruritus ani. Several exposures were given and the anus was severely burned.

In the treatment of such cases Bevan removes the injured tissue and obtains complete repair by skin-grafting, a plastic operation, or granulation. The operation is performed under local anesthesia,  $\frac{1}{4}$  gr. of morphine having been given previously by hypodermic injection. The entire injured integument is removed, and the mucous membrane of the rectum separated and brought down for about  $\frac{3}{4}$  in. The line of incision is closed with silkworm sutures and the integument stitched to the mucous membrane of the rectum with eight or ten fine black silk sutures.

A. R. HOLLENDER.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Hall, A. J.: Some Clinical Points Connected with Gall-Stones.** *Lancet*, 1920, cxcix, 633.

Jaundice is not an essential symptom of cholelithiasis, being present only when a stone is lodged in the common duct. The most frequent and important symptom is abdominal pain or discomfort in the upper right quadrant radiating to the back or right shoulder. This pain is characterized by its rather sudden onset, rapid increase to acute severity, duration of a few hours, sudden decline in acute severity with more gradual decline of soreness,

a tendency to follow unusual activity, and its occasional but not constant relation to the ingestion of food. Complete freedom from pain between acute attacks is suggestive although in some cases there may be chronic discomfort with tenderness of the gall-bladder.

Text-books give middle life as the age of most frequent occurrence of gall-stones, but the author believes that they may be formed much earlier. A diagnosis of chronic or nervous dyspepsia is frequently made in the cases of young persons and remains uncorrected until autopsy or operation following an acute attack, when the stones have been present ten, twenty, or thirty years. Frequently in such instances the diagnosis of floating kidney is made, and in a few cases this may be an associated condition. Of 30 of the author's cases the onset of symptoms occurred before the twentieth year of age in 4, between the twentieth and thirty-fifth year in 7, between the thirty-fifth and fortieth year in 7, and after the fortieth year in 12.

The treatment of gall-stones is considered surgical but for various reasons operation may be inadvisable or the patient may refuse to submit to it. The dangers to which such patients expose themselves are persistence or recurrence of pain, inflammatory complications, the development of cancer in the gall-bladder region, and chronic pancreatitis. Advancing age does not seem to predispose to increasing frequency of attacks. The relationship of cholelithiasis to malignancy is questionable, but the presence of stones seems to be a factor in their localization.

M. R. HOON.

**Homans, J.: Results of Cholecystectomy, with Particular Reference to Dilatation of the Common Duct.** *Boston M. & S. J.*, 1920, clxxxiii, 282.

This article is based upon a series of 250 cases treated at the Brigham Hospital, Boston. The operative mortality in 223 cholecystectomies was 54 per cent. One hundred and sixty-five of these patients were traced following the operation. Six had recurrences, the condition of 32 was improved, and 127 (77 per cent) were cured of the gall-bladder or biliary passage complaint.

Among 46 cases in which the gall-bladder had been completely functionless, the common duct was discovered at operation to be definitely dilated in 40. In 18 of the 40, stones were found in the common duct. Case reports in which the account of the operation was unsatisfactory—39 in all—were not considered in this study. Dilatation of the common duct was found also in 18 cases in which the gall-bladder was functioning and in 10 of these, stones were present. In 3 other cases obstruction of the duct had been suggested by jaundice.

Of 49 cases in which the gall-bladder had become functionless shortly before operation the common duct was found to be dilated in 18. In 27 cases it was normal. That dilatation of the common duct does not prevent a return to health is evident from



the fact that 83 per cent of the patients traced were well one and one-half years or longer after the operation.

Of 70 patients whose ducts were found to be of the normal size at the time of operation (but presumably have become dilated since), 73 per cent are well. Even in the cases of those whose condition was not improved no new symptoms have developed. It is suggested that stone formation within the duct is encouraged by duct dilatation.

The author's conclusions from this study are as follows:

1. There is satisfactory experimental evidence indicating that the removal of the gall-bladder is followed by dilatation of the extrahepatic biliary ducts.

2. There is evidence that destruction or loss of function of the gall-bladder within the human body is frequently followed by dilatation of the ducts.

3. There is evidence that duct dilatation occurs occasionally while the gall-bladder is functioning and in the absence of stone in the common duct.

4. There are no symptoms characteristic of dilatation of the biliary ducts.

5. There is no evidence that dilatation of the biliary ducts is harmful.

C. R. STEINKE.

Cambridge, P. J., Forsyth, J. A. C., and Howard, H. A. H.: *The Blood and Urine in Pancreatic Disease*. *Lancet*, 1920, cxix, 393.

It was shown by one of the authors in 1904 that when the urine of a patient suffering from an inflammatory affection of the pancreas is boiled with hydrochloric acid, the excess neutralized, and a phenylhydrazine test carried out with the resultant liquid, a much larger yield of osazone crystals is obtained than from the normal urine.

Subsequent experiments with dogs confirmed the results of clinical experience and showed that an increased formation of osazone crystals after hydrolysis of the urine occurs when the function of the pancreas is interfered with by operation. These crystals were found also to have the character of a pentosazone. In 1913 a quantitative method, in which the "iodine coefficient" of the urine was determined, was devised and described. This method is of particular value as it is applicable to diabetic as well as to sugar-free urine and therefore makes possible the investigation of the functional activity of the pancreas in glycosuria. A long series of experiments showed that the iodine coefficient of healthy urine is nil, but in the presence of pancreatic disease it varies from 12 to 20 per cent.

A comparatively simple method of estimating the dextrin content of the urine in suspected pancreatic disease is described in detail. The authors studied the blood in an attempt to trace the source of urinary dextrin in disease of the pancreas. The reducing power of a protein-free filtrate from the blood before and after hydrolysis with hydrochloric acid was estimated by a modification of the Folin and Wu process.

It has been known for some time that the normal blood contains small quantities of a carbohydrate substance which, on being boiled with a dilute acid, yields a reducing body. The fact that the percentage is enormously increased when the functional activity of the pancreas is interfered with by disease suggests that the amount of this substance is controlled by some influence exerted by that gland on carbohydrate metabolism.

In disease of the pancreas the urine contains an excess of dextrin. This can be measured by the iodine coefficient of the urine and, less accurately, by the difference value of the urine.

The difference value of the blood in pancreatic disease varies directly with the iodine coefficient of the urine and is due probably to the same cause, i.e., an abnormal dextrin content.

The difference value of the blood and the iodine coefficient of the urine are highest in the fasting state and gradually diminish after a meal for about three or four hours. After another three or four hours they return again to the fasting level.

The difference value of the blood and the iodine coefficient of the urine vary inversely as the percentage of sugar in the blood after a meal.

The difference value of normal blood ranges from 0.002 to 0.008 per cent and is not appreciably influenced by the ingestion of food.

The amylolytic ferment of the blood and urine in pancreatic disease varies directly with the percentage of sugar in the blood after a meal and inversely as the difference value of the blood and the iodine coefficient of the urine.

The results of experiments on the blood of depancreatized animals confirm the conclusions based on clinical observations mentioned. The laboratory technique used is given in detail. The results of the animal experiments are summarized as follows:

1. The rise in the difference value of the blood resulting from interference with the function of the pancreas insufficient to produce frank hyperglycemia and glycosuria diminishes as the volume of the gland is further reduced and the percentage of sugar in the blood and the excretion of sugar in the urine rise.

2. The hydrolyzable substance in the blood on which the difference value depends appears to be derived chiefly from the glycogen stores of the liver and is an intermediate soluble product (dextrin) which is formed in the conversion of glycogen to sugar.

3. The liver contains an amylolytic ferment which passes into the blood and urine. The glycogen of the liver is broken down as a result of its activity.

4. The pancreas exerts a restraining influence on the glycolytic ferment of the liver probably through its internal secretion. The internal secretion of the pancreas is maintained in such a way that the percentage of sugar and the difference value of the blood are kept within well-defined limits. When this balance is interfered with abnormal relations result.



5. Normally, the balance between the glycolytic ferment of the liver and the internal secretion of the pancreas is so maintained that the percentage of sugar and the difference value of the blood are kept within well-defined limits. Interference with this balance results in abnormal relations.

6. A relative increase in the pancreatic secretion causes a fall in the percentage of sugar and the difference value of the blood.

7. A relative diminution in the secretion of the pancreas, with consequent greater liberty of action on the part of the glycolytic ferment of the liver, gives rise in the early stages to an increased formation of the intermediate products of glycogen degradation without any change in the sugar, and in the later stages to increasing sugar production with a proportional diminution in the intermediate products.

8. The appearance in the blood and urine of intermediate products of carbohydrate metabolism, as shown by the difference value of the blood and the iodine coefficient of the urine, indicates a pre-diabetic condition which, if allowed to progress unchecked, will be followed by hyperglycæmia and glycosuria.

9. A considerable amount of well-boiled starch is absorbed into the portal circulation in the form of dextrins and maltose, whereas uncooked starch enters the portal blood chiefly as dextrose.

C. F. ANDREWS.

**Koetlitz: A Case of Cancer of the Pancreas** (Un cas de cancer du pancréas). *Arch. méd. belges*, 1920, lxxiii, 291.

Koetlitz describes the case of a woman 63 years of age who had a distinctly palpable tumor in the supra-umbilical region. Besides this tumor there was nothing to suggest a neoplasm of the stomach, pancreas, or liver. The patient complained, however, of pain in the abdomen which was quite independent of the ingestion of food and caused a dragging sensation extending throughout the chest.

The author finally diagnosed the condition as a cancer situated probably on the greater curvature of the stomach in the vicinity of the pylorus.

At operation a tumor was found in the head of the pancreas which did not extend into the body or tail of that organ. It did not involve the stomach but exerted pressure on the pylorus. Only partial removal was possible. The symptoms recurred after a few weeks and death resulted several months later.

In seeking to explain his error in diagnosis the author suggests that the absence of icterus in this case was due to the fact that, extending backward and upward, the tumor left the outlet of Wirsung's canal into the duodenum intact. This direction of a growth would account also for the intense pain which was caused probably by compression on the ganglia of the sympathetic nerves and the coeliac plexus. The situation of the tumor explains the persistence of the pancreatic function, the excretory ducts remaining partially patent.

In this case the cardinal symptoms of a neoplasm of the head of the pancreas were absent, viz.: (1) compression on the common duct causing icterus and dilatation of the gall-bladder, and (2) disturbance of the intestinal digestion of fat.

In agreement with other observers quoted, the author concludes that there is no pathognomonic symptom of pancreatic disease and that a diagnosis may be made only by observing all of the symptoms together.

W. A. BRENNAN.

## MISCELLANEOUS

**Heuer, G. J.: A Clinical Study of Thirty-nine Cases of Combined Thoracic and Abdominal Wounds.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 273.

In another paper the author presented a study of 160 penetrating war wounds of the thorax. Fifteen cases in which there was associated injury to the abdominal viscera were included in the series because the thoracic injury overshadowed the abdominal injury in severity. In this article Heuer considers combined thoracic and abdominal wounds, and for completeness again includes the 15 cases of combined wounds reported before and adds 24 others not previously considered. The present series, therefore, consists of the following 39 cases: (1) 21 cases under the author's care at Evacuation Hospital No. 1; (2) 15 cases operated upon by a group of surgeons at Evacuation Hospital No. 1 during September, 1918, and under the author's care after operation; and (3) 3 cases treated at Base Hospital No. 18 at a time when it was functioning as an evacuation hospital.

For convenience Heuer divided the patients into three groups: a group of 4 patients who were moribund on admission and for whom no treatment was possible except measures to combat shock; a group of 6 patients not operated upon primarily but treated expectantly; and a group of 29 patients subjected to immediate operation.

The patients of the first group were very seriously injured and were admitted in a condition of profound shock with open sucking chest wounds and signs of abdominal irritation. The chest wounds were closed by strapping and the usual measures were taken to combat shock, but death occurred within a few hours.

In the second group there were 2 bullet wounds and 4 shell wounds; 5 were penetrating wounds and 1 a perforating wound; all were closed wounds. Shock was profound in 2 cases, moderately severe in 2 cases, and practically absent in 2 cases; it was overcome in all instances. One patient pursued an uncomplicated course to recovery. Three developed infected hæmothorax. Two of these were treated by rib resection and drainage with subsequent sterilization of the cavities, and 1 by repeated aspirations. All recovered. One patient developed gas gangrene. Amputation was done, but death followed symptoms of gas intoxication.



In the third group were 28 shell wounds and 1 bullet wound. Twenty-seven were penetrating wounds, and 2, perforating wounds. The majority of these patients showed evidence of shock.

There were 17 cases of thoracic wounds on the right side. Nine of these patients recovered and 8 died. One died on the operating table, and 7 died of shock. Of 10 patients with thoracic wounds on the left side, 4 recovered and 6 died. Three died within twelve hours after the operation from shock, 2 died within thirty-six hours after operation from shock and peritonitis, and 1 died from peritonitis two days after operation. Two patients with abdominal wounds died from shock within twelve hours after operation.

Of the entire series of 39 patients, 17 recovered and 22 died, a total mortality of 56 per cent. Excluding the deaths of the 4 patients who were moribund on admission to the hospital, the mortality was 46 per cent. Analyzing the results from the standpoint of the known injuries to solid and hollow abdominal viscera, the mortality was 40 per cent when solid abdominal viscera alone were injured and 86 per cent when hollow abdominal viscera were injured.

G. E. BEILBY.

**Behan, R. J.: Interperitoneal Adhesions, Their Origin and Prevention.** *Am. J. M. Sc.*, 1920, clx, 375.

For the formation of adhesions between two adjacent areas of bowel, or between the bowel and

viscera, the opposing surfaces must be denuded, or if one is not denuded, the apposed surfaces must be in intimate contact for a considerable length of time. If both surfaces are denuded, only a short period of apposition is necessary. When there is denudation of the adjacent surfaces, union does not occur if there is sufficient movement between the apposed areas to inhibit intimate contact for a certain period of time.

Chemicals such as tincture of iodine, Dakin's solution, and strong solutions of mercury bichloride cause the formation of adhesions by destroying the frail endothelium of the serosa. Drying of the serosa by exposure to the air does not result in adhesions.

Lanolin and boric acid do not prevent the formation of adhesions when a normal inflammatory tissue reaction due to bacterial invasion is present. They retard their formation only in the absence of an inflammatory reaction. They do not always prevent adhesions when adjacent surfaces are denuded and kept in intimate contact, or when blood is present between apposed immobile surfaces. No ill effects have been observed following their use, however, and they greatly diminish postoperative pain.

To prevent intimate contact of traumatized or denuded areas of intestine it is advisable to change the patient's position frequently after operation and to give drugs, like eserine, to stimulate peristaltic activity. Tympanites should be treated immediately with heat.

SAMUEL KAHN

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Ryerson, E. W.: Traumatic Osteomyelitis as Seen During the War.** *J. Orthop. Surg.*, 1920, ii, 499.

The author's deductions are based on more than 2,000 cases of infected bone wounds treated at U. S. Army General Hospital No. 28, Fort Sheridan, Illinois, since Jan. 1, 1919.

The cases may be divided roughly into two classes: (1) cases of severe infection, and (2) cases of persistent discharging sinus formation without severe constitutional disturbances. Primary débridement had been performed in all instances and in the majority three or four sequestrotomies had been done before the patient arrived at Fort Sheridan.

In the severe types either Carrel-Dakin treatment was used or what was termed a "very reliable substitute," a wound pack of gauze saturated in Dakin's fluid. Nearly every case required an operation of some kind, usually a sequestrotomy, and proper drainage.

In the second class more than 70 per cent of the cases showed sequestra and approximately 40 per cent had cavities which would not heal permanently. Sequestrotomy followed by a careful and complete

cauterization of the bone cavity gave extremely satisfactory results. In cavities near joints, where this method was not applicable, transplantation of free or pedunculated masses of fat was tried but the results were questionable. The use of pedunculated flaps of healthy and well-vascularized muscle is therefore recommended instead. In several cases in which the lower end of the femur was partially lost the bone cavity was packed with Dakinized gauze until the bacterial count was reduced to a minimum, when a large flap of the vastus muscle was turned down and pressed into the cavity. The results were good. The author recommends the more extensive use of this method, especially in the treatment of the femur and tibia. L. D. PRINCE.

**Lovett, R. W., and Wolbach, S. B.: The Roentgenographic Appearance, Diagnosis, and Pathology of Some Obscure Cases of Bone Lesions.** *Surg., Gynec. & Obst.*, 1920, xxxi, 111.

For the past five years the authors have been engaged in a study of certain obscure bone lesions occurring in the orthopedic service of a hospital for children. The cases presented are those in which, in the authors' opinion, there was doubt as to the correct diagnosis from the roentgen-ray findings and other data available before operation.



As studied by the roentgen ray, the reactions of bone to pathologic conditions are three in number: (1) atrophy or diminution in lime content; (2) destruction of bone tissue, local or general; (3) a formative process characterized by the formation of new bone or condensation of the bone around a focus of disease. The general point of view with regard to these processes has been that tuberculosis is largely destructive in character; that, as a rule, the destructive action is general; that the condition is characterized by marked atrophy of the affected bone with perhaps atrophy of contiguous bones in the same limb; and that it occurs in the region of the epiphysis. Osteomyelitis has been regarded generally as a process which is at first destructive in character and then formative, the formative process generally becoming dominant. Syphilis has been considered as the most purely formative of the three processes, though in some degree it is also destructive.

When the authors attempted to study roentgenograms taken before operation from the point of view of pathologic findings, it became evident that these criteria could not be depended upon; that tuberculosis, which has ordinarily been believed to occur in the articular ends of bones, might occur in the shaft; that it might be almost a purely formative process; that the formative process might co-exist with the destructive process and ultimately become dominant; and that a local destructive process, indistinguishable from the so-called "Brodie's abscess" might occur in a pure tuberculosis so that a well walled-off localized cavity in bone might be formed. It appeared also that a wedge-shaped destruction in the articular end of the bone, the base of the wedge being directed toward the joint, might occur both in tuberculosis and osteomyelitis, and that under these circumstances the two conditions are practically indistinguishable. In the authors' experience, the errors in diagnosis have consisted more often in mistaking tuberculosis for other conditions than in mistaking other conditions for tuberculosis. A curious punched-out lesion of the skull was identified pathologically in two cases as being due definitely to tuberculosis. Confusion arose also between osteomyelitis and syphilis, two cases in which the lower end of the fibula was involved being practically identical in the roentgen picture. Again, the stage of repair as seen in the roentgenogram is very similar in osteomyelitis to that in syphilis.

As it has appeared to the authors, the problem of differentiating the three conditions mentioned by means of the roentgen-ray is not encountered, as a rule, in the routine case in which a purely destructive lesion is due to tuberculosis. The lesion of rapid destruction with marked formative activity is generally osteomyelitis, and a purely formative process is most probably syphilis. A serious problem in the differential diagnosis occurred most often in cases in which focal lesions were present and the phenomena of formative and destructive activity had become so mixed that the diagnosis was impossible without a pathologic examination. The value of a

pathologic diagnosis made during operation is evident to any surgeon as it guides him in the treatment of the bone cavity and is often the direct factor deciding whether or not the cavity should be closed.

Brief clinical histories of 13 cases of bone tuberculosis, 5 cases of osteomyelitis, 4 of syphilis, and 1 each of bone cyst, sarcoma, osteochondrosarcoma, and chondrosarcoma are given with their roentgen findings and pathologic reports.

In the discussion which concludes the article the authors state that the diagnosis of infectious lesions of the bones would be simple if each infectious agent always produced the same reaction. The pyogenic bacteria alone may be counted upon to conform to type. In infections due to these micro-organisms there is necrosis with more or less local disappearance of lime salts followed by new bone formation from adjacent healthy bone structures. It must be remembered that in the reaction of bone to injury new formation of tissue is always followed by ossification and therefore granulation tissue from bone or periosteum becomes bone tissue. The simple sequence in the pyogenic infections accounts for the definite criteria applicable to cases of osteomyelitis.

Syphilis affects bone in two ways, causing the destruction or new formation of bone or both. Destruction of bone follows the formation of local, rapidly-formed gummatous lesions. In some cases these lesions are of endosteal and periosteal origin and in others are perivascular and extend into the bone. In other cases the degree of reaction to the spirochætae may be slight, resulting only in proliferation of the cells of the periosteum and endosteum; the new tissue develops osteoblasts and eventually new deposits of bone are formed. In one case, therefore, there is choking of the normal bone by the gummatous process, followed by necrosis, while in the other case bone-forming tissue is stimulated.

In tuberculosis of bone, as in tuberculosis of the soft tissues, there may be: (1) a fibrinous or puriform exudate, (2) discrete proliferative lesions, the tubercles of which may progress slowly or rapidly with much or little caseation, and (3) a diffuse proliferative reaction following the exudative which is essentially tuberculous granulation tissue with much or little caseation. In the third instance, in the granulation tissue, new bone may be formed, just as in the repair of pyogenic processes, at a time when destruction or resorption of bone is going on.

The important lesson from this pathologic study is the reminder that in its location and character tuberculosis of bone may simulate many infectious processes. Occasionally, therefore, a diagnosis from roentgen studies alone is impossible and recourse must be had to other clinical evidence and, when possible, to pathologic examination.

ADOLPH HARTUNG.

**McMeans, J. W.: Experimental Chronic Suppurative Arthritis.** *Am. J. M. Sc.*, 1920, clx, 417.

The effect of various organisms on the joints has been studied by McMeans over a period of years.



The joint reaction caused by the streptococcus viridans is of a comparatively mild type. The single strain of streptococcus used in the author's experiments was isolated from the pus of an abscess in the submaxillary gland. The organism was a gram-positive coccus in chains of five or six. On blood-agar it grew in a small, shiny, nipple-like colony surrounded by a distinct clear zone of hæmolysis. Fermentation of lactose and salicin and negative results on mannite and inulin placed the organism in the class of the common streptococcus pyogenes (Holman).

The organism used for the inoculations was cultured in columns of dextrose infusion broth and the culture diluted so that each cubic centimeter represented 15 ccm. of the original culture. Thirty-four animals were injected with doses varying from 1 to 2.5 ccm. each. The symptoms presented following these doses were comparatively mild. The length of time the animals lived after the treatment varied widely, ranging from three to eighty-seven days.

The lesions produced by the injection of streptococci were almost entirely limited to the joints. Joint involvement occurred after a period varying from several days to several weeks. The average number of lesions in six animals treated with the original organism was four, while that in eight animals treated with the original organism after artificial cultivation for three months was eight.

The joint reaction consisted of a suppurative process characterized by more or less distention of the capsule with a creamy sticky fluid. In many instances the pus extended into the peri-articular tissues and frequently could be traced from one joint to another along the tendons and fascial planes. In some cases a suppurative involvement of the adjacent muscles was found. Again, hæmorrhage into the subcutaneous tissue and muscles of the involved legs occurred in some instances, and not infrequently a diffuse, jelly-like, subcutaneous serous exudate was present.

In ten of the animals, the heart and kidneys were affected, the lesions consisting of areas of necrotic debris surrounded by large and small mononuclear leucocytes. The areas in the heart muscle were commonly found well within the structure and had no particular relation to the endocardium or pericardium.

MORRIS KAHN.

**Dubs, J.: Epicondylitis of the Humerus** (Zur Frage der sog. Epicondylitis humeri). *Schweiz. med. Wchnschr.*, 1920, I, 166.

The clinical picture first described by Vulliet in 1909 is not well known although not at all rare. Epicondylitis of the humerus is characterized by a severe localized sensitiveness over the external epicondyle of the humerus and its immediate neighborhood which persists for a long time and is not influenced by any kind of treatment. In time it disappears spontaneously.

The author reports briefly the histories of 9 new cases of his own. With one exception the right elbow was involved and in every instance the exter-

nal epicondyle. Apparently the condition is due to trauma which is continued over a long period and is caused by some occupational movement. In this connection the author refers to the epicondylitis of tennis players, better known as "tennis elbow," and that of artisans which is of similar origin. A carefully taken history usually reveals the fact that the arm affected has been subjected to a prolonged strain in the flexed and supinated position. The author accepts Preiser's explanation that the cause is an injury to the capsule of the humero-radial joint which may involve the periosteum.

The phrase "incongruity of joint surfaces" frequently used by Preiser to explain the symptoms the author rejects. In rare instances a single direct trauma has been the cause of the condition. It is in such cases that the local periostitis described by Momberg and Blecher may be observed.

Accuracy of diagnosis is of importance from the standpoint of accident insurance as in the majority of cases the condition may not be classed legally as due to an accident.

HEINEMANN (Z).

**Waldenstroem, H.: Coxa Plana, Osteochondritis Deformans Coxæ, Calvé-Perthes' Disease, Legg's Disease** (Coxa plana, Osteochondritis deformans coxæ, Calvé-Perthes'sche Krankheit, Legg's Disease). *Zentralbl. f. Chir.*, 1920, xlvii, 539.

An article by Perthes in the *Zentralblatt fuer Chirurgie* in 1920 caused the author to call attention to the fact that of the five investigators who, in 1909 and 1910, described the pathologic picture of the disease under discussion Perthes was the last. The sequence was as follows: Sourdat and Waldenstroem in 1909, and Legg, Calvé, and Perthes in 1910.

The chief characteristics of the disease are the symptoms, development, and final outcome described by the author in 1909. Only his theory as to the etiology was incorrect. Perthes' conception of the disease as osteochondritis deformans coxæ, however, was equally at fault, for pathologically and anatomically signs of inflammation are lacking. In Waldenstroem's opinion it is impractical to call the condition after one of its several investigators. He therefore suggests the use of the term "coxa plana" which denotes that a flattening of the head of the femur has taken place. This term is analogous to those applied to the other two diseases of the hip joint, coxa vara and coxa valga. Moreover it does not refer to the etiology, a fact which is in its favor as the cause of the condition is not yet definitely clear.

The three types of deformity of the hip have many features in common. In all of them the origin must be sought in a pathologic change in the firmness of the neck or head of the femur. In coxa vara this change involves chiefly the neck, while in coxa plana it affects chiefly the head. The deformity arises secondarily through a static condition and becomes fixed through ossification. The permanent condition may be designated as "coxa plana statica"



just as formerly we spoke of "coxa vara statica." When the original cause is discovered the term "statica" may be changed to "congenita," "traumatica," or some other term, as was done in the case of coxa vara.

TROMP (Z).

**Brandes: The Practical Significance of Anteversion in Luxatio Coxæ Congenita and Its Correction** (Ueber die praktische Bedeutung der Antetorsion bei der Luxatio coxæ congenita und ihre Korrektur). *Verhandl. d. deutsch. orthop. Ges., XV Kong., Dresden, 1920.*

Anteversion of the femur is no hindrance to reposition but is of importance in retention. In the second Lorenz position the lower part of the neck may become blocked at the lower posterior edge of the acetabulum and this may eventually lead to anteversion. Ninety per cent of all re-luxations are due to anteversion. Other factors, such as the height of the acetabular rim, are also responsible. Nevertheless there are many cases of recovery in spite of anteversion. Brandes has found the following method of treatment successful:

Reposition and the application of a cast in the first Lorenz position. After three or four weeks osteoclasis is done at the lower end of the femur. The peripheral end is then turned 90 degrees forward and retained in this position with a new cast. Later, after the removal of the cast, the sagittal position of the neck is compensated by turning the leg.

In 7 cases a complete cure was obtained. The method should be employed only on children with re-luxation.

In discussing this paper Ludloff stated that in the cases of older patients on whom an operation cannot be performed he has secured good results with the subtrochanteric osteotomy, the femur being placed 48 degrees backward and in slight abduction. Not only is the lordosis influenced favorably by this procedure, but the Trendelenburg symptom is overcome. This is due to the fact that during walking the gluteus is put under tension. The same operation was employed successfully also in cases of gunshot injuries received during the war. Ludloff performs it on only one side. Patients with bilateral dislocation walk as if the condition were unilateral.

Alsberg ascribed the proper tension of the gluteus resulting from osteotomy to the lowering of the trochanter. He also has used the subtrochanteric osteotomy and has obtained good results when the condition was bilateral.

SIMON (Z).

**Buelow-Hansen, V.: The After-Treatment of Congenital Luxation of the Hip** (Einige Erfahrungen bei der Nachbehandlung der angeborenen Hüftgelenksluxation). *Norsk Mag. f. Lægevidensk., 1920, lxxxi, 460.*

In the reduction of unilateral or bilateral luxation of the hip the author follows the classical method of Lorenz. He also employs the Slomann sling. The head of the femur is thus held nearer the socket

and displacement is prevented. This sling is recommended especially for difficult cases, those of older patients with 4 or 5 cm. of shortening. By means of a cast the widest possible pronation can be obtained and in this position the head of the femur usually lies most snugly in the socket. As a rule the cast must be worn for about three months, but in the cases of older patients two months or even six weeks may be sufficient.

The author early abandoned the method of putting on the cast while the leg is extended. His reason was that there should be no adduction of the limb before there is pronation to about 90 degrees; in other words, when the patient is lying down the leg should hang down.

When the X-ray shows the position to be satisfactory, massage should be begun, especially massage of the gluteal muscles and those of the upper portion of the thigh. In addition, active motion should be instituted. Extension and pronation must be retained even during the massage. Attempts to adduct the limb passively are contra-indicated. Twice daily the child should assume a straddling position on the floor so that the leg is in pronation and touches the floor on tip-toe. Later strutting should be practiced with the hands on the hips. If possible, dancing lessons should be given. The forced movements should be continued from one-half to five years. In fact, this after-treatment should be employed with intermissions throughout the patient's youth. A normal walk, free movement in all directions, normal musculature, and normal relationships as demonstrated by the X-ray are usually obtainable in patients between 2 and 3 years of age. In the cases of older patients there are exceptions. In a few an arthritis deformans or a condition resembling Calvé-Perthes' disease may develop.

In re-luxation the author reduces the dislocation again under anaesthesia and applies a cast. Flexion of the hip occurring during the after-treatment will take care of itself if the leg is otherwise in good position. Tenotomy is never performed by the author. In epiphyseal separation and in fracture of the neck of the femur during the reduction a cast including the leg and foot is applied. Occasionally paralysis sets in and in such cases the tip-toe position must be avoided. In the most favorable cases the paralysis clears up when the bandage is removed.

KORITZINSKY (Z).

**Ludloff: Extension Contractures of the Knee** (Streckencontracturen im Kniegelenk). *Verhandl. d. deutsch. orthop. Ges., XV Kong., Dresden, 1920.*

Extension contractures of the knee joint are frequently ischæmic muscle contractures caused by subfascial hæmatomata. In the treatment of fractures of the forearm (not only the typical fractures of the radius) Ludloff is more and more departing from fixation in supination and employing the Karr splint.

The "hunger osteopathies" cannot be ascribed merely to insufficiency of food. The recent explana-



tion in the literature that they are due to the lack of sufficient salt seems more plausible.

Following the reading of Ludloff's paper Borchard stated that he had demonstrated on himself the excellent functional healing of a severe knee-joint fracture. Koellicker stated that he had observed a fracture of the femur with 4 in. of shortening, strong callus, and angulation in an infant 4 days old who had been born normally. On the convexity of the deformity was a long-healed skin scar. The fracture therefore must have occurred in the uterus. During the sixth month of pregnancy the mother had sustained a severe blow on the abdomen in falling from a wheel chair.

Other surgeons speaking at this meeting were Deutschlaender, Simon, and Schwanz. For the treatment of healed and deformed peri-articular fractures Deutschlaender recommended his lever method in which opening of the joint during reposition is avoided. Simon stated that in healed deformed subcutaneous fractures osteotomy should be performed at the site of greatest deformity. In gunshot fractures, however, the danger of reviving an old infection and the advisability of doing the osteotomy away from the original site of injury must be taken into consideration. Simon reported a case of thoracic gibbus which occurred after late tetanus. This condition, he believes, must be regarded as a spondylitis similar to that occurring after pneumonia and other infectious diseases. It is not due to muscle spasm causing a crushing of the vertebral body as the spinal muscles cannot possibly act in this manner.

In a discussion of injuries of the spine Schwanz stated that he knows of no reason why he should discard his theory of insufficientia vertebræ as the muscle spasm alone is sufficient to crush a vertebral body. The pull of the muscle, however, always works toward the production of a kyphosis. Schwanz considers insufficientia vertebræ as the beginning of osteopathic phenomena in the spine. SIMON (Z).

### FRACTURES AND DISLOCATIONS

Seele, W.: **The Medico-Mechanical Method of Treating Fractures in the Bergmannsheil Hospital** (Ueber die mediko-mechanische Behandlung der Frakturen im Krankenhaus Bergmannsheil). *Monatsschr. f. Unfallheilk.*, 1920, xxvii, 126.

According to Hoffa, two-thirds of all accident claims are based upon the consequences of fractures. It is therefore of extreme importance to secure ideal healing. Disturbances of function should be cleared up as soon as possible. Such disturbances are due at times to injury of the soft parts (œdema and contraction of tissue) and injury to the joints (synovitis followed by contracture, adhesions, and ankylosis) which are usually the result of improper treatment. The therapy best adapted to overcome functional disturbances is medico-mechanical therapy consisting of gymnastics, massage, and the use of hot air and electricity.

Immobilization according to Lucas Championnière is unnecessary in a large percentage of fractures and should be replaced by active therapy. Among such injuries are fractures with old fissures and infractions, impacted fractures, fractures of one bone where two or more run parallel, fractures of joints or near joints, fractures of the radius, olecranon, and patella with a diastasis of not more than 7 cm., and chipping off of the epicondyle and condyles of the humerus and tibia. These should be treated under the control of the X-ray according to the requirements of the individual case. The methods of choice are the old well-known methods: active movements twice daily for ten or fifteen minutes and later passive motion.

If motility is still impaired after consolidation the application of force and resistance movements to overcome the joint stiffness and free movement by the patient are necessary. Instead of a circular cast, molded splints should be used without fixation of the neighboring joints. In fractures of the upper arm the shoulder should be left free. In fractures of the tibia early walking should be allowed. If fixation of the neighboring joint is necessary the cast should be removed from the joint itself. Extension is not employed very often—only when there is marked displacement of fragments and, of course, usually in the treatment of fractures of the femur in which stiffness of the knee cannot always be prevented.

The after-treatment of functional disturbances following adhesive-tape extension should be easier to overcome than that due to nail extension which is very painful. The treatment is especially difficult in children under 10 years of age.

While this article does not offer anything new, it is a good résumé of the results obtained by medico-mechanical measures. SCHEUER (Z).

Royster, H. A.: **Demonstration of the Barrel-Stave Splint in Fracture of the Clavicle.** *South. M. J.*, 1920, xiii, 663.

The author presents a method of treating fractures of the clavicle by means of a barrel stave applied across the upper chest. He does not claim originality. He believes the Desault, Velpeau, and Sayre dressings are anatomically incorrect. It is not the pull of the muscles which produces the deformity but the weight of the shoulder which falls downward and forward.

In the method recommended the middle of a barrel stave which has been cut off at the ends is fitted to the chest. The center of the concavity fits within the heads of the humeri and a curve is put over the middle of the suprasternal notch. A nail is driven into each end of the splint but not through it. There is sufficient concavity here to fit the ordinary chest. The splint is well padded. Royster ties the corner of the bandage in on the nail, and makes figure-of-eight turns securing the shoulders.

Slipping is prevented by means of adhesive.

PHILIP LEWIN.





Fig. 1. Front view, padding purposely omitted from splint.



Fig. 2. Back view showing figure-of-eight.

*Boyster: Barrel-Slave Splint in Fracture of the Clavicle*

**Cole, W. H.: The Use of the Thomas Bed Knee-Splint for the Routine Treatment of Fracture of the Shaft of the Femur.** *Minnesota Med.*, 1920, iii, 391.

The recent war has brought the Thomas bed knee-splint into prominence and the author urges its more common use for fractures of the femur in civil practice. The splint is not applicable, however, to sub- or transtrochanteric fractures or fractures of the neck which require more or less complete abduction. Sometimes also swelling or injury around the groin, perineum, or buttock contra-indicates its use.

The author prefers fixed extension rather than continuous or elastic traction by weight and pulley, as the latter, because of the patient's movements which vary the ratio between the extension weight and the body counter-weight, does not afford absolute fixation.

In the use of the Thomas splint the tuberosity of the ischium is one fixed point and the end of the splint the other. These points are joined by the unyielding side bars of the splint. Traction on the distal fragment is obtained through the skin by means of adhesive plaster or glued flannel strips, and the traction straps are tied down to the end of the splint so that they cannot slide upward. The force or energy acting at the site of the fracture is therefore definitely fixed.

The most important feature of the Thomas splint is the ring. This must be of the right size to keep it from slipping over the tuberosity of the ischium and resting on the perineum. The padding should not be more than  $3\frac{1}{2}$  cm. in diameter and the circumference of the ring about 4 cm. greater than the circumference of the thigh at the groin.

The bed splint, unlike the walking splint, is symmetrical and can be used for either side. The bed-

splint ring is slightly ovoid and the center of the larger or more rounded side is attached to the inner bar. The side bars are from 15 to 20 cm. longer than the limb.

The splint must be applied very gently as pain causes muscular contraction. The limb is shaved and the extension straps are applied so that the upper ends extend a short distance above the site of the fracture. The lower ends are sewed into webbing straps or loops. Spiral adhesive straps may be used for additional security, and then the whole limb wrapped with a roller bandage to hold the adhesive firmly to the skin. Care must be taken, however, to prevent constriction. There should be no pressure over the malleoli, and the adhesive should not be applied to these prominences.

After the straps are in place an assistant holds the limb under traction and the splint is slipped on. The extension straps are then passed, one over, and the other under, their respective side bar, pulled tight, and brought together and tied at the notch in the distal cross-bar of the splint. A screw attachment, fastened into the bottom of the splint, may be used to tighten the straps if necessary.

The author applies a well-padded posterior splint between the limb and the slings which run from one side bar to the other. The splint is bowed anteriorly to maintain the normal anterior bowing of the femur, and is arranged to cause slight flexion at the knee. The slings, which are made of muslin or flannel, should be tight enough to keep the side bars running approximately along the midline of the lateral surfaces of the limb. Frequently the posterior gutter splint is unnecessary. Coaptation splints are sometimes used on the anterior surface of the thigh and held in place by circular ties of bandages. The foot is kept at a right angle.



In order to keep the end of the splint off the bed so that the heel will not be subjected to pressure, a rest or an overhead frame is used. The latter allows the patient greater freedom of movement.

Within twelve to eighteen hours the muscles relax sufficiently to make tightening of the traction straps necessary. This is done several times during the first few days, and the tape measure is used daily until the injured limb is of the same length or even slightly longer than the other. If possible, the X-ray should be employed to verify the measurements and the position of the fragments. If length and alignment with the normal anterior bowing of the femur are preserved it is not necessary to have perfect end-to-end approximation.

Compound fractures are treated in the same way as simple fractures, the supporting slings being adjusted so as to allow easy access to the wounds.

Old malunited fractures are refractured and then treated as outlined. The structures should be over-stretched by means of a block and tackle and the splint applied while the patient is under the influence of the anæsthetic.

Careful nursing is necessary to prevent pressure sores over the tuberosity of the ischium. The pressure may be relieved by abducting, raising, or lowering the limb. The skin must be kept clean and dry.

Early weight bearing should be avoided on account of the possibility of a moldable callus. To prevent it the Thomas caliper splint is of value. The knee should be bent as soon as it is safe to release the traction straps long enough, and the bending should be repeated daily.

D. H. LEVINthal.

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Bosch Arana, G.: A New General Technique for Cinematic Amputations** (Nuova tecnica per le amputazioni cineplastica). *Chir. d. organi di movimento*, 1920, iv, 296.

In cinematic amputations performed according to Vanghetti's method the greatest surgical difficulty is to obtain cicatrization of the motor tunnel. In the method described by the author this difficulty is overcome by the formation of four cutaneous bridges. The stumps to which this method is applied are old stumps selected for tertiary cinematization. Four equidistant longitudinal incisions varying from 8 to 15 cm. in length are made through the skin and subcutaneous cellular tissue, their lower extremities extending to about 3 cm. from the distal end of the stump. The four skin sectors are then dissected out separately from the aponeurosis and in this manner four well-nourished bridges of skin are formed.

The second stage of the operation consists of the exposure of the bone through each of the four skin incisions. In the third stage an osteotomy is done with the Gigli saw. The bone stump is then trimmed.

The next step is the treatment of the muscles. When it has been decided which muscles are best adapted to the type of motor desired, the soft parts are sectioned between two longitudinal incisions (either anterior and posterior or external and internal), and a frontal or lateral loop is formed.

Epidermization is effected by suturing the opposed strips of skin over the muscle motor so that the internal and external surfaces are brought together back to back. In this way the motor is covered only by an external skin surface. W. A. BRENNAN.

**Delangeniére, H., and Lewin, P.: A General Method of Repairing Loss of Bony Substances and of Reconstructing Bones by Osteoperiosteal Grafts Taken from the Tibia.** *Surg., Gynec. & Obst.*, 1920, xxx, 441.

Repair of bones by osteoperiosteal grafts either for loss of substance or reconstruction consists in transplanting into the defects, not only bone and periosteum, but all the elements of a callus which subsequently becomes new bone. This method is of value in the treatment of pseudarthrosis, the obliteration of a bony cavity or trephine opening, the rebuilding of bones partially or completely, and the formation of a strong arthrodesis. The grafts are obtained usually by removing from the tibia thin layers of bone with the periosteum. Depending upon the size of the graft, one or both of the tibiae may be used. The internal surface of the tibia is chosen because of its accessibility, large size, and vascularity.

Without cutting the periosteum, which is exposed thoroughly, a long incision is made through the skin over the middle of the internal surface of the tibia and the grafts are outlined with a scalpel and removed with a chisel. The bevel is kept high and the cutting edge is held firmly against the bone. The graft should be about as thick as a ten-cent coin. After its removal, it is placed in a compress and immediately transplanted into the wound previously prepared for it.

Strict asepsis is necessary. Antiseptics should not be used as they reduce the vitality of the graft. Bones to be grafted must be entirely free from osteitis, and the skin must be healthy and sufficient to close the wound easily. Dead spaces must be eliminated, and the extremities of the graft must be in contact with the ends of the bone to be repaired. The graft should be held in place by catgut sutures through the muscles. Foreign bodies are harmful to the vitality of the grafts.

This report is based on 273 cases of osteoperiosteal grafts, and shows that the operation described is nearly always followed by reconstruction of the bone.

D. H. LEVINthal.

**Standage, R. F.: Tendon Transplantation and Fixation for Nerve Injuries.** *J. Roy. Army Med. Corps*, Lond., 1920, xxxv, 120.

This article covers the work on tendon transplantation carried out in an East African military



hospital. Three types of nerve injury were treated by tendon transplantation: (1) irreparable injury to the musculospiral nerve with wrist-drop; (2) similar injury to the median nerve; and (3) injury to the musculocutaneous nerve in the leg with paralysis of the peronei muscles and resulting pes equinovarus.

In cases of musculospiral paralysis the following transplantations were carried out:

1. The pronator radii teres, detached from its radial insertion, was transplanted into the long and short radial extensors.

2. The flexor carpi radialis tendon, divided at the wrist, was brought round the radius and over the wrist extensors, and transplanted into the tendons of the extensores ossis metacarpi, primi and secundi internodii pollicis, and the extensor indicis.

3. The flexor carpi ulnaris tendon, divided at the wrist, was brought round the ulna and transplanted into the tendons of the extensor carpi ulnaris and the extensors of the three inner fingers.

The operation preferred by the author is performed in the following manner:

The arm is laid on its ulnar side on a small table placed at right angles to the operating table. An incision through the skin and deep fascia, 3 in. long, is made over the middle third of the radius. The supinator longus and the two radial extensors are separated and the former is retracted forward. The radius is then exposed. The tendon of the pronator radii teres having been recognized by the direction of its fibers, the thick tendon is well separated from the surrounding structures by blunt dissection, a large hernia needle is passed round it, and it is cut away from its insertion into the middle of the outer surface of the radius. In cutting the insertion free the knife must be kept close to the bone so that the tendon is separated cleanly. The wrist is then fully extended and held in that position by an assistant. The tendon of the pronator teres is applied to the extensor carpi radialis brevis. At the most convenient point an incision is made through the short extensor tendon and the pronator tendon is passed through it. The pronator tendon, which then lies between the short and the long extensors, is stitched in position with several fine silk sutures, some of which include all three tendons. All bleeding is stopped, the wound stitched, a temporary dressing applied, and the operation then continued.

The arm is turned onto its posterior surface. An incision about 1 in. in length is made through skin and fascia at the wrist over the tendon of the flexor carpi ulnaris. The tendon is freed, an aneurism needle is passed under it, and the tendon is pulled forward. A second short incision is then made over it about 4 in. above the former incision. Through this incision the flexor carpi radialis tendon is freed. An aneurism needle is then passed again round the tendon at the wrist, care being taken that the median nerve is not included, and the tendon is divided as near its insertion as possible.

In the next step the arm is turned onto its anterior surface, sterile swabs being placed over the two small incisions. An incision 3 or 4 in. long is made from the wrist upward, over the center of the posterior surface of the forearm. Through this incision the tendons of the extensor ossis metacarpi pollicis, the extensor primi, the extensor secundi internodii pollicis, and the extensor indicis are separated. A swab is then placed over the wound, the arm is turned again onto its posterior surface, and a long thin pair of forceps is passed under the fascia and pushed out through the upper wound on the flexor surface. The flexor tendon is seized by its end and drawn through to the extensor surface in a slanting direction. Incisions are made in the four extensor tendons and the tendon of the flexor carpi radialis is passed through them and stitched to each by means of very fine silk sutures.

The tendons of the extensor carpi ulnaris and the three inner extensors of the fingers are now freed. A swab is placed over the long wound on the extensor surface and the arm once more turned with the flexor surface upward. The flexor carpi ulnaris tendon is treated in the same way as the flexor carpi radialis: divided at the wrist, pulled out through a wound 4 in. above the wrist, and transferred to the extensor surface by being pulled under the fascia in a slanting direction round the ulna. The ulnar flexor tendon is then attached to the extensor carpi ulnaris and the extensors of the three inner fingers.

The five wounds are stitched, a dressing is applied to them and to the wound over the pronator teres, and the hand is put up on a splint which maintains it in a position of extension.

For division of the musculocutaneous nerve in the leg with paralysis of the peronei the author transplants the tendon of the peroneus longus into the outer side of the active tibialis anticus. The tibialis anticus thus becomes a bifid tendon pulling up the outer and inner sides of the foot at the same time.

In cases of irreparable injury to the external popliteal nerve with consequent drop-foot Standage has employed tendon fixation. The technique is that described by Sir Robert Jones, with trifling modifications.

In cases of irreparable complete division of the trunk of the sciatic nerve the ankle is usually found to be fixed in a position of equinus and the paralyzed ham-strings are contracted so that the knee joint is fixed in semiflexion. For such a case the following operations are carried out: (1) lengthening of the tendo achillis; (2) fixation of the peroneus longus and tibialis anticus; (3) tenotomy of the ham-strings; and (4) resection of the knee to produce a stiff joint.

In paralysis due to injury of the ulnar nerve an attempt was made in the base hospitals to unite the divided ends in every case. This was done in view of the grave crippling produced by this injury because of paralysis of the intrinsic muscles of the hand. No tendon transplantation will modify this and the only hope is successful nerve suture. The



author has carried out several second sutures of the ulnar nerve, using subcutaneous fat to surround the ends after union and to prevent their adhesion to surrounding tissues. Sufficient time has not yet elapsed, however, to warrant a report on the end-results.

G. W. HOCHREIN.

**De Mata, T. R.: The Albee-Delbet Operation** (La operación de Albee-Delbet). *Rev. españ. de cirug.*, 1920, ii, 129.

The prognosis in fracture of the neck of the femur is grave because in practically all cases only fibrous union can be expected. The failure in bony union is due to the poor blood supply of the head of the femur. In examining many cases operated upon Delbet was unable to find a single instance of firm union. He therefore tried to join the fragments by means of a metal screw, but this procedure failed because it was difficult to pass the screw through at the desired point; it tended to pass either posteriorly or anteriorly to the neck.

The angle made by the axis of the neck and shaft of the femur is 125 degrees and that made by the axis of the neck with a horizontal plane when the patient is lying on his back varies as much as from 15 to 40 degrees. Delbet's "screw director" was meant to obviate the difficulty in introducing the metal screw in the right direction. After the patient is under the influence of an anæsthetic the feet are brought together and the shortening is reduced by a steady pull on the affected limb. A horizontal incision is then made over the greater trochanter and the drill in the Delbet director is placed from 1 cm. to 1½ cm. below the tip of the trochanter. The distance traversed by the drill is usually between 6 and 8 cm. In recent fractures a metal screw is used and in long-standing non-union, a piece of fibula.

The two weak points in Delbet's method are: (1) the use of a metal screw, and (2) the unsatisfactory manner of drilling the hole. Albee suggested the use of bone pegs instead of metal pegs and exposure of the joint through an anterior horizontal incision along the medial border of the sartorius muscle.

The Albee-Delbet technique is as follows: With the patient on a fracture table the greater trochanter and the joint are exposed as described. A hole is then drilled through the trochanter and the neck and head of the femur, the direction of the drill being controlled by palpation through the anterior incision. The drill is left in place until the surgeon is ready to insert the bone peg. The limb is put in a plaster cast in the Whitman position or dressed with a simple gauze bandage.

The use of beef-bone pegs or screws as recommended by Henderson brings very definite results.

Even with the Delbet technique there are many cases of non-union, probably because of some disturbance of the endocrine system.

The author believes that an impacted fracture of the neck of the femur should be left unmolested unless coxa vara or coxa valga results, but Whitman advocates abductive treatment regardless of im-

paction. The main points in the Whitman technique are that the affected limb is abducted and rotated only to the limits of abduction and internal rotation of the sound limb, and impaction of fragments is caused by abduction.

De Mata reports the results in seven cases. The ages of the patients varied from 30 to 65 years. The functional outcome was excellent. The Delbet method is the operation of choice in cases of recent fracture and old cases of non-union and also for those in which the Whitman conservative treatment has failed.

PIO BLANCO.

**Spier, H. W.: An End-Result Study of Arthrodesis for Non-Tubercular Affections of the Hip Joint.** *J. Orthop. Surg.*, 1920, ii, 515.

The operative work reported was performed largely on the service of Brackett and in most cases Brackett's method of approach was used. An effort was made to destroy the joint cartilage, to approximate the raw bony surfaces, and to immobilize the extremity in the position of greatest functional value.

Subsequently a questionnaire was sent out to discover as far as possible what the patients themselves thought of the result, the length of their convalescence, and their present condition as regards disability and self-support. The examination covered the questions of ankylosis, function, and position.

Ankylosis seemed to be obtained most readily in cases in which the hip condition was due to definite trauma. The end-result in the 5 cases in this class was satisfactory.

In the cases operated upon for disability due to hypertrophic arthritis the outcome was not as favorable. In some of these union was doubtful while in others it was not obtained at all. As this type of arthritis is characterized by eburnation of the articulating surfaces which hinders union, it would seem that, to obtain satisfactory results, a more thorough, radical, and destructive operation and more prolonged postoperative immobilization are necessary than in arthritis of traumatic origin.

Several of the patients complained that the results were unsatisfactory at the end of about one year, but that the condition was relieved at the end of from two to five years. In such cases the ankylosis was only partial at the earlier date and consolidated later. The X-ray study of a number of these cases was not very satisfactory. Little can be learned from radiographs regarding doubtful ankylosis in hip joints in which there are bony overgrowths.

The extremity was immobilized at the time of the operation in abduction and was held in that position as far as possible for a varying length of time during the period of convalescence. High double plaster spicas were used during the first weeks and then replaced with a single spica for ambulatory fixation. In spite of this, however, the hip was in definite abduction in only 3 cases. In 4, the position was neutral, while in the remaining 18 there was



definite adduction. Regarding rotation of the limb, the report shows that the external position was retained fairly well.

The author summarizes his conclusions as follows:

1. Arthrodesis gives a satisfactory end-result in cases of painful hip due to trauma.
2. When the condition is due to hypertrophic arthritis arthrodesis is justified but the results are less satisfactory.
3. The time of convalescence is long, approaching one year.
4. As the extremity tends to return to the position of adduction, little should be promised in this regard.

L. C. DONNELLY.

**Parker, C. A.: The Treatment of Bow-Legs and Knock-Knees.** *Surg. Clin. Chicago*, 1920, iv, 705.

The most common orthopedic deformities resulting from rickets are bow-legs and knock-knees. These deformities are not the result of walking too early but are observed more frequently when walking has been delayed six months because of generalized weakness. In bow-legs the condition has a natural tendency to correct itself. In knock-knees this tendency is absent. The deformities are greatest usually during the second and third years of age, the active period of rickets, and become fixed during the succeeding stage of bone eburnation.

During the early stage deformities may usually be corrected by the persistent use of rigid apparatus of iron or plaster of Paris maintained until the bones harden.

In older cases fracture of the bones is the best and practically the only certain method of correcting the condition. During the active stage fracture is open to objection because the bones must be held in position a long time or until eburnation occurs and non-union sometimes results. Therefore operative treatment should be deferred until the rachitic process has ceased and the osseous structure is normal. Parker prefers to operate between the fourth and fifth years of age as the bones are then in a condition favoring rapid union and still small enough to be broken with the osteoclast. In older children an open osteotomy should be done because of the danger to the soft tissues from too great pressure with the osteoclast. The osteoclast recommended by the author is the Grattan osteoclast which is adjustable.

In bow-legs the deformity is practically always below the knee and the bones are broken with the single pressure bar of the osteoclast on the outside and opposite the apex of the deformity. This breaks the fibula first and then the tibia. In knock-knees the single bar is placed on the inside of the femur, usually close above the knee.

The operation is performed under local anæsthesia, the bones being broken by means of the cross bar as rapidly as the screw can be turned. The usual time required is from four to eight seconds. As soon as the bones are broken the bar is quickly released by reversing the screw. The pressure of the

polished steel bars of the osteoclast makes three discolored areas on the skin, but this is of no importance.

Immediately after the fracture the leg is placed in a plaster of Paris cast which, in cases of bow-legs, extends from the toes to the perineum and in cases of knock-knees extends to the umbilicus and includes the hip. While the plaster is setting the deformity is corrected manually with a certain amount of over-correction. If the bones are suitable for normal union the casts are left on for five or six weeks. As a rule the child is able to get up within a week after the removal of the cast.

Several hundred cases treated in the manner described were remarkably free from surgical complications. In some of the more vicious deformities several fractures have been made in the course of a few years.

The illustrations accompanying the article show the manner of using the osteoclast and some of the results obtained.

F. G. MURPHY.

### ORTHOPEDICS IN GENERAL

**Wright, H. W.: Nerve Lesions Following Common Types of Back Strain and Their Relation to the Prognosis of Disability.** *J. Orthop. Surg.*, 1920, n.s. ii, 477.

The forms of back strain discussed are such as are frequently met with in industrial and private practice. Their exact pathology is often very obscure.

In many of the cases described prompt orthopedic treatment gives satisfactory results, but in others the disability continues for some time. In the latter type a careful neurological examination will frequently shed light on the nature of the condition.

The cases reported are cases of low back strain due to the lifting of heavy objects while the spine was strongly flexed and strains due to sudden falls or missteps which resulted in symptoms and signs referable to the various branches of the lumbosacral plexus.

As many structures may be involved in a sudden strain of the back, the pathology may be multiple in its manifestations. The clinical picture may be still further confused by such complications as arthritis.

Two of the nine case reports given in the article are briefly as follows:

A professional golfer, 30 years of age, fell down a ladder and struck the right buttock. This occurred Nov. 18, 1918. Since then he has complained of pain in the distribution of the superior gluteal nerve, especially when standing or bending forward. Massage, manipulation, and the use of a low back brace have failed to give relief. No pathologic lesion was demonstrated by the X-ray. An examination May 1, 1920, showed a diminished lumbar curve with rigidity of the lumbar muscles when the spine was flexed forward or laterally, and the presence of infection of the tonsils. The pain in the gluteal nerve continues and after eighteen months the patient is



incapacitated for work. In this case it is probable that an arthritis is present in addition to a slight plexus lesion.

A man 40 years of age wrenched his back while climbing a telephone pole in October, 1913. Immediately thereafter symptoms of obstruction of the bowels developed and a laparotomy was performed. The cause of the obstruction was not learned. The patient recovered, enlisted in the navy, and after the war was discharged in good condition. In May, 1919, while lifting timber, he again strained his back and experienced severe pain in the lumbar region. This was followed by numbness of the limbs, frequent desire to urinate, and obstinate constipation. A neurological examination seven months later showed weakness and loss of tone in the muscles of both legs and thighs, exaggerated tendon reflexes, double ankle clonus, the Babinski reflex, and a gait which was a combination of ataxia and spasticity. Sensation was diminished in the lower extremities but particularly on the left side. The patient was not seen again but recently it was learned that he was operated upon for a suspected cord tumor. The report of the surgeon is as follows: "Extensive thickening of the dura from the level of the fourth to the sixth dorsal vertebrae and extending around and along the nerve roots." The pathologic diagnosis was chronic pachymeningitis. There was no labora-

tory evidence of syphilis in this case. It seems probable that, following the comparatively slight trauma (back strain) which did not cause any bone lesion of the spine, the patient had had an extensive extramedullary and intramedullary hæmorrhage and the exudate became firmly organized.

In commenting on the cases reported the author calls attention to the signs indicating an actual lesion of one or more branches or the lumbosacral plexus which were present in every case except one. While the form of the lesion could not be demonstrated, the fact that it was either an intraneural or extraneural lesion was shown by such signs as persistent pain in spite of immobilization of the spine, isolated muscle weakness, and absence of the achilles reflexes. In the third case there were signs of involvement of the spinal cord. At operation and pathologic section the condition was found to be an extensive subdural and extradural hæmorrhage.

Attention is called also to the chronicity of the symptoms in the majority of the cases reported and the long period of incapacity for work. In 7 cases the average period of industrial disability was fourteen months; in 2 of these the period was two years; in 1, twelve months; in 1, twenty months; in 1, six months; and in another, three months. One patient is permanently disabled.

L. C. DONNELLY.

## SURGERY OF THE NERVOUS SYSTEM

**Irland, R. D.: The Pathology and Surgical Treatment of Peripheral Nerve Injuries.** *J. Missouri State M. Ass.*, 1920, xvii, 307.

This article is based on 500 cases treated at the U. S. Army General Hospital No. 28.

In making a diagnosis of division of a peripheral nerve a differentiation must be made between an anatomical and a physiological interruption of the nerve impulses. If this cannot be done operative treatment should be delayed for a number of months. Scar tissue may interrupt impulses without destroying the neurofibrils distal to the point of compression. In some cases a recovery results in eight or ten days after the removal of scar tissue. Before suturing a nerve the neuromata on the proximal and distal segments and the nerve on the proximal and distal sides of these neuromata must be resected until the neurofibrils herniate from the cut surface. To avoid bruising and laceration, this should be done with a small, thin, sharp blade.

It seems fairly well established that neurofibrils will grow from 1 to 2 mm. a day. The radial nerve seems to return to normal fairly promptly. Next in quickness of response is the sciatic nerve and then the median, the ulnar, and the external popliteal nerves.

If splints are used at all they should be employed for the purpose of giving elastic traction. If muscle changes are permitted to occur to a marked extent the regeneration of the nerve will be of no avail.

The chief points of the article are summarized as follows:

1. Immediate suture is best if it has been proved that there is complete interruption of the nerve.
2. If the condition of the nerve is unknown operation should be delayed for a few months as spontaneous recovery may result.
3. End-to-end suture is best. If this is impossible, an auto-cable transplant should be employed.
4. The resection of all scar tissue is essential.
5. The field must be kept dry.
6. Care must be taken to prevent axial rotation.
7. In suturing, fine catgut or silk, and very fine and round needles should be used.
8. The closure of the epineurium must be perfect and enclose all neurofibrils.
9. Rigid splints should not be applied at any time.
10. Physiotherapy to prevent atrophy and fibrosis of the muscle is of great importance.

C. R. STEINKE.

**Toraca, L.: The Blood Circulation of Isolated Nerves** (*La circolazione sanguinea dei nervi isolati*). *Chir. d. organi di movimento*, 1920, iv, 279.

The author has made a number of experiments on dogs to study the circulation of the blood in isolated nerve trunks. This question has become of im-



portance because of the advances in nerve surgery during the war. The chief object of the author's experimental research was to determine whether the endovascular network of vessels was sufficient to nourish all of the isolated tract. Accordingly the isolated nerve trunks were wrapped with a protecting medium to cut off any collateral supply which might develop from the surrounding tissues. The nerve selected for the experimentation was the sciatic nerve.

The author's conclusions from his study are as follows:

1. Even if nerve trunks are isolated beyond the usual limits of blunt dissection all the nerve vessels are spared.

2. Simple isolation of a nerve causes only an incidental reaction.

3. When a nerve is isolated and surrounded by a strip of rubber the most important reaction is hypertrophy and dilatation of its blood vessels.

4. Even when the nerve is isolated for its entire length and permanently removed from contact with the surrounding tissue its vascular network is sufficient for its nutrition.

W. A. BRENNAN.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

McCarrison, R.: *Dietetic Deficiency and Endocrine Activity, with Special Reference to Deficiency (Edemas)*. *Brit. M. J.*, 1920, ii, 236.

The author bases his paper on the results of experiments performed on pigeons, guinea pigs, and monkeys. The animals were fed on six types of deficiency diets. The effect of these diets on the endocrine organs is attributable to three causes acting singly or in combination: (1) deficiency of vitamins, (2) imperfect balance of food with respect to proximate principles, and (3) the accidental occurrence of pathogenic agents in the body.

The endocrine organs are influenced profoundly by dietetic defects. They all undergo more or less atrophy and depreciation of function, with the exception of the adrenal glands and, in the male, the pituitary body. These latter become enlarged in accordance with the varying character of the deficiency.

The adrenalin content of the enlarged adrenals is increased when the diet is deficient in vitamins and proteins and disproportionately rich in starch. Animals fed on scorbutic diets, especially in the presence of intercurrent infection, have enlarged adrenals with a decreased adrenalin content.

Edema is found to bear a definite relationship to the adrenalin content of the enlarged adrenals of pigeons fed on autoclaved rice. When the adrenalin content is high, edema occurs in 86 per cent of cases; when it is low, edema does not occur. Fresh butter contains a substance which is protective against edema and maintains the adrenalin content at a low level. Butter varies in its capacity for protecting against edema. This variation is dependent on the quality of the cow's food. Cows fed on green fodder produce a butter which has a greater protective capacity than those fed on dry fodder. Coconut oil does not possess this protective property.

Adrenalin appears to control the excretion of urine; therefore it is important to know that the adrenalin output is influenced by the quality of the food taken.

G. S. FOULDS.

Sennels, A.: *A Case of Papillomatous Tumor of the Thyroid, with a Consideration of the Malignancy of Such Tumors* (Fall von papillomatoesen Geschwuelsten in der Schilddruese mit einer Uebersicht ueber die Malignitaet solcher Geschwuelste). *Hosp.-Tid.*, 1920, lxiii, 337.

Wherever papillomatous tumors develop they frequently show a tendency to malignant degeneration although often the microscopic examination may not give positive evidence of a change of this nature.

Experimentally induced gastric tumors exhibit a papillary structure and occasionally prove themselves to be malignant (metastases). The determination of benignancy and malignancy is especially difficult when the growths are situated in the thyroid gland. All of the numerous cases collected by Langhans proved to be malignant.

On the basis of his own observations and investigations the author differentiates two types of papillomata of the thyroid. Macroscopically they are small, hard, and nodular tumors and larger cystic tumors. Microscopically the former show extending from their walls a distinct vessel-bearing papillary connective-tissue framework covered with high cylindrical epithelium. In the latter there are communicating cystic cavities from the smooth walls of which project cauliflower-like growths. The structure of the connective tissue is papillary and occasionally shows fine interwoven branches. The epithelium is cubical. In the former an ingrowth of the epithelium into the tumor capsule is seen, but in the latter type there is no such evidence of malignancy. The latter type seems to have a tendency to break into the venous stream. In one case, though the tumor did not penetrate the capsule, multiple metastases were formed in the lung.

Whether the tumors are of branchiogenic origin or of parathyroid origin still remains to be determined.

Sennels points out that a thyroid cancer of this type is not uncommon in salmon. If the observations made are correct, there is some relationship between this condition and infection by a nematode.

SAXINGER (Z).



**Macrae, D., Jr.: The Prevention and Treatment of Wound Shock in the Theater of Army Operations.** *Illinois M. J.*, 1920, xxxviii, 108.

The author believes that the Medical Department of the Army should take steps toward preparedness. With this in view there should be included in the training of all physicians instruction in war surgery and medicine dealing with such subjects as the management of hospitals, ambulance organization, sources of supplies, the evacuation of the sick and wounded, the conservation of men and food, etc.

In regard to the prevention of wound shock Macrae quotes largely the statements of Cowell. From determinations of the blood pressure, pulse, and respiration of men in the trenches before and after they were wounded it was found that the blood pressure is always higher "just before something happens" when the men are excited and worried. A prolonged excessive effort, eventuating in fatigue and associated with excitement, worry, and high tension for six days when the men have little opportunity for sleep and are cold, wet, and insufficiently nourished results in a marked disturbance of the nervous system with relaxation of the vasomotors. In addition, acidosis develops because of a decrease in the alkalinity of the blood.

The exact cause of shock is not known, nor do we know what shock is. Three degrees of shock are recognized: (1) slight shock with no depression of the blood pressure, which is observed usually in those who have lost little or no blood; (2) delayed shock, observed in those who have moderately severe wounds but are not in immediate danger; and (3) immediate shock which occurs in those with the most severe or mortal wounds.

Gas gangrene always produces shock. Shock may be divided also into: (1) primary wound shock, which is nearly always fatal, and (2) secondary wound shock which is largely preventable by alleviation of the causes which include pain, fear, cold, hemorrhage, and sepsis.

Measures for the prevention of shock, taken first at the regimental aid station, are repeated at the dressing stations, and if necessary, at the casualty clearing station. Such measures include:

1. Morphine in sufficient dosage to dull the pain and reduce apprehension, but not in over-dose. Usually  $\frac{1}{4}$  gr. is sufficient.
2. Warmth during transportation and at every station while the patient is on the litter.
3. Alkaline drinks to combat acidosis.
4. Hot fluids by rectum.
5. Intravenous injections preferably of 5 per cent gum arabic solution with 4 per cent soda bicarbonate solution.
6. Blood transfusion, in extreme cases.

At the casualty clearing station it is regarded as advisable to wait a while before operating. Gas and oxygen are the best anesthetics, but ether also is good. Chloroform should never be used at this station.

The patient should be kept warm in bed and given fluids by rectum or intravenous injection. In some cases transfusion may be necessary.

The author does not agree with Cowell regarding the benefit of gum salt, preferring whole blood, citrated blood, and saline.

In regard to so-called "shock teams" Macrae states that experienced surgeons are to be preferred to those who are young and inexperienced. He advocates a larger personnel and more equipment.

Other points of improvement suggested are:

1. An increase in the trained personnel for aid and dressing stations.
2. The training of men in the army as regards first aid, litter bearing, the danger of shock, and the necessity for heat and saline drinks.
3. Good splinting, especially the Thomas variety, and the training of all enlisted men in their application as in the British army.
4. More equipment to furnish warmth for the wounded in dressing stations and field hospitals.
5. The selection of the most experienced officers for surgical triage.
6. Hot thermos bottles and better heating facilities for ambulances.
7. Special marks for the severely wounded in order that they may be treated more quickly.
8. Less surgery and more beds, heat, and hot saline drinks in field hospitals.
9. Less shock and more surgery in mobile hospitals.

M. H. HOBART.

**Bevan, A. D.: Pilonidal Cyst.** *Surg. Clin. Chicago*, 1920, iv, 765.

The case reported was that of a man 28 years of age who was believed to have multiple anal fistulae. The patient had been in excellent health until two years previously when an abscess developed on the left side of the anus. This abscess was opened but a fistula remained. Although several operations were performed to close the fistula, a cure had never been effected. Subsequently other fistulae developed in the same region, with the result that at the time of the examination by the author five fistulous tracts were present. These apparently opened into an ischio-rectal abscess on the left side and also into the bowel.

The operations performed previously were done for ischio-rectal abscess and anal fistulae. The operation performed by Bevan, however, showed that the condition was a pilonidal cyst in an unusual situation. Dissection demonstrated that the abscess and the fistulae did not lead into the rectum. The author states that to obtain a permanent cure in such cases a very complete excision is necessary.

A. R. HOLLENDER.

**Smith, E. F.: The Production of Tumors in the Absence of Parasites.** *Arch. Dermat. & Syph.*, 1920, ii, 176.

Smith first describes the varieties of tumors in plants. These growths are due to numerous causes



chief of which are living things such as gall flies, plant lice, nematodes, fungi, myxomycetes and bacteria. Other factors are frost and mechanical irritation and the acidity of imperfectly aerated tissues. The influence or relation of the parasite in this connection is of interest. "All tumors, so far as they are due to parasites, must be assumed to be due to the chemical-physical action of the by-products of the metabolism of these parasites, just as most communicable diseases are due, not to the parasites themselves, but to their toxins."

For the past fifteen years the author has been experimenting with crown gall. During this time a widely distributed, harmful plant tumor has been demonstrated to be due to a schizomycete. The bacteriologist has been able to isolate the organisms from this tumor and the growth has been reproduced by pure culture inoculations and the grafting of portions to suitable parts of healthy plants. If taken early, the tumor may be removed successfully, but in the later stages it often returns after removal.

Further experiments conducted by the author have demonstrated that the by-products of the parasite may stimulate normal cells to become tumor cells.

Following out the theory that disturbed cell respiration is at the bottom of tumor formation, Smith attempted last year to find what results could be obtained in the absence of parasites by limiting the intake of air in various ways. The same result was reached in every experiment—increased acidity of tissues and the formation of small hyperplasias. Smith believes that these changes take place only as the result of an anaerobic cell respiration acting on the youngest, most active cells of a tissue. Some oxygen must always be present, however, or there will be complete asphyxiation of the tissues, such as occurred in the early experiments.

The most striking tumors are obtained by the inoculation of the crown gall organism, bacterium tumefaciens. Some of the growths are simple tumors while others contain roots and shoots and still others show the beginning of secondary tumors. In the embryomata the invasion of tumor tissue into the embryomatous parts (young roots and shoots) was noted.

A. R. HOLLENDER.

**Pfahler, G. E.: Roentgen Rays or Radium Combined with Excision in the Treatment of Keloids.** *Arch. Dermat. & Syph.*, 1920, ii, 181.

Pfahler believes that if it is made more generally known that radium and the roentgen rays will prevent growing scars and cause their disappearance, patients will be more apt to seek assistance.

Prominent among those who long ago called attention to the value of the roentgen rays in the treatment of keloids was McKee. While the work was conducted without any definite plan and the technique was imperfect, brilliant results were obtained. Much skill and judgment are necessary even

when the technique is definite, however, for no two cases react in the same way. The aim should be to produce a progressive atrophy without erythema or a destructive effect on the skin or underlying epithelium.

The technique must be varied considerably with the size or thickness of the keloid, especially when the roentgen rays are used alone. The thicker and older keloids require more filtration and correspondingly longer treatment. In recent cases of hypertrophied scars in which the scar tissue is still quite young considerably less treatment and filtration is necessary.

Radium will give very similar results if used in corresponding doses. Plaques or capsules may be employed. The dose given should be an erythema dose. A 50 mg. capsule in 0.5 mm. of silver and 1 mm. of rubber in direct contact will produce an erythema dose in one hour.

The author's object in bringing this subject before the profession is to emphasize the value of the combined treatment. This method is original with Pfahler only in that he has arrived at conclusions regarding it and has been recommending it for a number of years independently of others who have been working along the same lines. When the keloids are large it seems advisable for many reasons to excise them before the roentgen-ray or radium treatment is begun. As a rule, however, the method consists of applying the roentgen rays to the keloid area a few days before the operation. The dose should then be the same as that used ordinarily when no operation is to be performed. The advantage of excision and combined ante-operative and post-operative roentgenotherapy consists in the fact that it reduces the scar to the level of the skin and in many instances causes a decrease in the total area of the scar.

Pfahler advocates and employs a full dose of roentgen rays within a week or ten days after the excision of the scar. The patient is then seen weekly, and if any tendency toward recurrence is noted, further treatment is given. Whenever in the author's cases the condition recurred after excision, the recurrence was thoroughly controlled by the roentgen ray or radium.

A. R. HOLLENDER.

## BLOOD

**Dreyer, G., Bazett, H. C., and Pierce, H. F.: Diurnal Variations in the Hæmoglobin Content of the Blood.** *Lancet*, 1920, cxcix, 588.

Lloyd Jones in 1887 pointed out the existence of definite daily variations in the specific gravity of the blood and found that it is highest between 9:00 and 10:00 a.m. and lowest between 6:00 and 7:00 p.m.

The changes are due very largely to the differences in the hæmoglobin content, the periods of highest and lowest specific gravity coinciding closely with those of the highest and lowest hæmoglobin content.



The necessity of paying attention to the daily variations in the hæmoglobin content was emphasized by Dreyer in 1919. It is hardly possible to form a correct opinion of the actual pathologic and physiologic changes which take place unless the diurnal variations are duly considered.

The technique developed by Dreyer is described in detail. Capillary pipettes made from glass tubing are drawn out so that a length of 15 cm. corresponds to a volume of 0.1 ccm. These are graduated by mercury from a standardized 0.1 ccm. pipette. A 20 ccm. pipette, graduated in tenths, is used for taking the quantity of saline required for dilution.

Five or six drops of blood are collected in a paraffined watch-glass and the dilution is made immediately. The watch-glass should be agitated continuously to prevent sedimentation of the corpuscles. In the case of human blood a dilution of 1 in 200 (0.1 ccm. of blood to 19.9 ccm. of saline) is convenient, but in the case of goats and rabbits a dilution of 1 in 150 is preferable. The blood is carefully mixed the tubes are put into cold storage, and the mixture is not hæmolyzed until immediately before the readings are made. Dry saponin is used as a hæmolytic agent. The tubes are left in a water-bath at 30 degrees centigrade until complete hæmolysis has taken place.

For all readings a Duboscq colorimeter is used. To secure comparable results from day to day the use of a yellowish artificial light is recommended. It is necessary on each occasion to determine the actual difference in the readings obtained by filling both cups with the same hæmoglobin solution, and to allow for these differences in the calculation of the experiment. When a series is being compared, one of the samples is poured into one cup and the others are read against it. A height of 10 mm. on the vertical scale will give a good color intensity. To secure an unchangeable standard from day to day, one or more of the bloods is finally read against a standard glass of suitable color.

There is some evidence that the female exhibits greater daily variations than the male. These diurnal variations may be connected closely with variations in the pulse rate, blood pressure, volume of respiration, and possibly fluid absorption or kidney secretion.

In conclusion the author makes the three following points:

1. The diurnal variations in the hæmoglobin percentage in man and animals are very considerable and may even reach as much as 30 per cent.

2. In attempting to establish the normal hæmoglobin content of the blood in a series of individuals it is essential to make the observations at a time when the daily variations are least, that is, between 5:00 and 7:00 p.m.

3. In the study of any phenomena in which alterations in the concentration of the blood are concerned it is necessary to view them in the light of the marked diurnal variations which may occur.

H. H. MINIER.

## BLOOD AND LYMPH VESSELS

**Roussiel, M.: Arteriovenous Anastomosis in the Treatment of Gangrene Due to Arterial Obliteration** (L'anastomose artério-veineuse dans le traitement des gangrènes par oblitération artérielle). *J. de chir.*, 1920, xvi, 257.

The author has made 12 experimental arteriovenous anastomoses of the carotid to the external jugular in animals. In most cases the results were good, the anastomosis remaining permeable. Of 63 clinical cases found reported in the literature a successful result was obtained in only 16. Poor results the author ascribes to unfavorable general and local conditions or the fact that operation was deferred until too late.

Roussiel finds from a study of the literature that in some cases arteriovenous anastomosis applied to the treatment of senile gangrene has been successful when other methods of treatment have failed completely. It is not successful, however, in cases of definite gangrene complicated by extensive and infected venous thrombosis. In such cases it is contra-indicated because it brings on a rapidly fatal septicæmia. Therefore in this condition amputation is necessary.

Arteriovenous anastomosis gives favorable results only in cases of beginning senile gangrene when the venous routes still allow a constant flow of blood toward the extremities. Roussiel believes that success will be obtained more frequently when cases are referred to the surgeon during the period which precedes the appearance of gangrene, a period characterized by cyanosis, great pain, and coldness in the extremities.

W. A. BRENNAN.

## GENERAL BACTERIAL INFECTIONS

**Sacquépée, E.: French Research on Gas Gangrene.** *Lancet*, 1920, cxcix, 605.

The entity known as "gas gangrene" is essentially a disease producing local and general reactions. The former consist of the formation of gas in the tissues, a surrounding œdema and swelling, and gangrene. The local findings may be present in cases other than those of true gas gangrene. If there is a general reaction characterized by rapid pulse, weakness, dyspnoea without chest involvement, and an earthy icteroid color of the skin, we are dealing with the true disease.

With this clinical entity in mind the French observers isolated bacteria which produced the disease experimentally. Both general and local phenomena must ensue to establish the identity of these pathogenetic organisms. As a result of these studies specific therapy was instituted and its results were very gratifying.

Two of the organisms found had been previously identified by other observers. One of these, *bacillus perfringens*, was found in 82 per cent of a series of 121 cases. It proved incapable of producing a potent toxin, although it caused gas formation and gan-



grene. The vibron septique, found in 28 per cent of cases, caused typical lesions and produced *in vitro* a very active toxin. This is a highly pathogenous and toxic organism. Atypical forms were found in 11 per cent of the cases.

The third organism, bacillus bellonensis (probably identical with bacillus oedematiens) was found in 35 per cent of the cases and is often the only one isolated in the so-called "white erysipelas." This is an anaerobic, straight, or slightly curved gram-positive bacillus bearing oval spores. It can be grown on glucose agar in which, in stab cultures, it produces a brown colony surrounded by a nimbus in twenty-four hours. The filtrates of broth cultures proved highly toxic. Bacillus bellonensis is difficult to detect in lesions and very pathogenic to rabbits and guinea pigs.

In establishing serum therapy resort was had to the so-called "protected guinea pig." This was used also to identify the organisms quickly. A guinea pig inoculated with gangrenous tissue and antisera for the bacillus bellonensis, bacillus perfringens, and vibron septique was protected in 96 per cent of cases. Sera were prepared in the usual way with small doses of the more toxic types until the animal (horse) became protected against larger doses. It was then possible to prepare an antitoxin of any desired strength. Live cultures of bacillus perfringens could be used.

With serum treatment 166 cures were obtained in 191 cases treated. In 136 of these the disease was fully developed when the treatment was begun. The mortality rate was therefore 13 per cent as compared with 75 per cent in untreated cases. It is essential that the serum be specific unless it is polyvalent. Prophylaxis has proved of great value in cases in which the disease is apt to develop. In such cases 7 per cent of those untreated developed gas gangrene while only 1 per cent of those treated contracted the disease. J. W. Ross.

**De Lavergne: The Diagnosis of Bacteriological Types of Gas Gangrene by Means of Specific Sera.** *Lancet*, 1920, cxcix, 607.

Gas gangrene was found associated with the presence of three micro-organisms, namely bacillus perfringens, vibron septique, and bacillus bellonensis, the latter probably identical with bacillus oedematiens. In many instances two of these organisms were found in the same lesion.

In order to treat gas gangrene it is essential to establish a bacteriological diagnosis. The most common type of case proved to be that of mixed infection, with oedema and gas. A more severe form was the white erysipelas which is associated with oedema only, and found to be due to infection by bacillus bellonensis. As the clinical variations were inadequate for the diagnosis, immunological tests with "protected" guinea pigs were made. The patient might thus be treated very early with large doses of the single serum indicated and the therapeutic power then increased.

Bacteriological tests were slow, growth was often scanty, especially with the vibron septique and bacillus bellonensis, and the association of organisms necessitated subculturing and repetition. Bacillus perfringens was often present in normal wounds and it was necessary to ascertain its power.

The principle of the "protected guinea pig" was sound and worthy of application. Five animals were used, including two controls, one of which received a dose of wound emulsion only, and the other a protective dose of antiserum for all three organisms. The three other animals received an injection of wound emulsion and a dose of antiserum for one of the three organisms, bacillus perfringens, vibron septique, and bacillus bellonensis.

A fragment of muscle from the limit of the seat of infection was first teased in about 10 ccm. of saline. The solution was then filtered through cotton and equal amounts were placed in five test tubes. The respective antisera were added before the injections were made and the mixture heated at 37 degrees centigrade for thirty minutes.

The diagnosis is reasonably sure in twelve hours and in twenty-four hours is certain. The protective serum which confers immunity indicates the organism present and serotherapy may be instituted on the basis of the findings of even the first twelve hours. In 60 per cent of cases only two animals survived; one was protected by specific serum and one by all three sera. Again in 35 per cent three animals survived, one remaining in good health. The two others showed oedema and local reaction as they were protected against only one of the two organisms present. These are cases of double infection. In 4 per cent of cases all the animals died. Such cases are rare and due to other organisms, such as atypical vibron septique, bacillus sporogenes, or some other aberrant germ. J. W. Ross.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Macht, D. I., and Satani, Y.: A Study of the Antiseptic Action of Certain Local Anæsthetics. I. The Antiseptic Action of Local Anæsthetics Against Staphylococcus Aureus and Bacillus Coli.** *J. Urol.*, 1920, iv, 347.

The following drugs were studied: cocaine, novocaine, stovaine, alypin, holocaine, alpha-eucaine, beta-eucaine, apothesine or the hydrochloride of diethyl-amino-propyl cinnamate, and benzyl alcohol. These drugs were dissolved in physiological saline solution in various concentrations and their antiseptic action was studied on the staphylococcus aureus and bacillus coli. Three methods were employed.

In one series of experiments different amounts of a 1 per cent solution of the various drugs were introduced into 5 ccm. of bouillon medium so as to make concentrations of the anæsthetics ranging from 0.04 to 0.4 per cent. A platinum loopful of a staphylococcus or colon culture was then quickly



introduced into the media thus prepared, and the test tubes were placed into the incubator for twenty-four hours. The growth of the organisms in the anæsthetic bouillon mixtures was then observed.

In a second series of experiments a loopful of staphylococcus or colon culture was introduced into solutions of the drugs varying in concentration from 0.01 to 5 per cent. These suspensions were then put into the incubator for different periods of time, ranging from ten minutes to twenty-four hours. After this they were rapidly centrifugalized, the fluid was poured off, and the organisms were washed with saline solution and separated again by a second centrifugalization. The bacteria were then taken up with a loop and cultured on agar media. After incubation for twenty-four hours the culture media were examined for growth.

In a third set of experiments a number of local anæsthetics were incorporated or mixed with agar media in proportions of 0.5 or 1 per cent and the media then inoculated with staphylococci and colon bacilli. An examination was made for growth at the end of twenty-four hours. As control experiments, the same kinds of organisms were cultured on plain agar media without the admixture of drugs.

The first series of experiments of course revealed the antiseptic rather than the germicidal effect of the different drugs. In the second series, in which the organisms were exposed to the action of the various drugs for different periods of time and then washed, failure to grow on agar afterward pointed to a bactericidal or germicidal effect of the drugs. The third series of experiments was of interest only in corroborating the results obtained in the others.

Cocaine and novocaine were found to be entirely devoid of antiseptic action. Alypin was shown to possess such properties but only in concentrations of 5 per cent. Slight antiseptic properties were exhibited also by holocaine, stovaine, and the eucaines, but only after long incubation periods. The beta-eucaine was more antiseptic in its action than the alpha variety.

Apothesine and benzyl alcohol exhibited a quite marked antiseptic action. Benzyl alcohol was most efficient without being in the least toxic in concentrations of 3 to 4 per cent, and was the most antiseptic as well as the most germicidal of the local anæsthetics studied. It was especially interesting to note that neither methyl alcohol nor ethyl alcohol, even in strengths of 5 per cent, exerted any antiseptic effect.

M. H. KAHN.

Swartz, E. O.: A Study of the Antiseptic Action of Certain Local Anæsthetics. II. A Study of the Antiseptic Action of Benzyl Alcohol and Other Local Anæsthetics Against the Gonococcus. *J. Urol.*, 1920, iv, 355.

Solutions of the following drugs were studied: alpha-eucaine, beta-eucaine, holocaine, alypin, apothesine, and benzyl alcohol.

Cocaine and novocaine solutions were found to be without any antiseptic action as regards the colon

bacillus and staphylococcus but were not tested against the gonococcus.

Alpha-eucaine, an isomere of the beta-eucaine, inhibited the growth of the gonococcus for the first twenty-four hours, but did not kill it. Only a few colonies survived in the 1 per cent solutions, but the 0.5 per cent solution permitted a very luxuriant growth. Beta-eucaine solutions neither killed nor inhibited the growth of the gonococcus in this period of time in the dilutions commonly employed in clinical work.

Alypin killed the gonococcus when used in 5 per cent solutions but a 2.5 per cent solution did not inhibit its growth. Alypin solutions have a reaction of pH 4.5 on the hydrogen-ion scale. The work of Davis and Swartz has shown that plain acid solutions, not of themselves germicidal, will kill the gonococcus in twenty minutes if of a hydrogen-ion concentration more acid than pH 4.5. The gonococcus, however, survived immersion in warm solutions of acids of a hydrogen-ion concentration of pH 4.5 for twenty minutes. Hence, the germicidal action of alypin must be due to some factor other than the acidity of its solution.

Holocaine hydrochlorate solutions have an acidity of pH 1.5, approximately that of tenth-normal acid, and its germicidal action is due probably to its acidity rather than to any specific action. Solutions of tenth-normal acid killed the gonococcus in a few minutes.

Apothesine killed the gonococcus in five minutes in strengths of 1, 1.5, 2 per cent, and over. A few colonies survived in 0.5 per cent solutions, but did not appear for forty-eight hours.

Benzyl alcohol in strengths of 3 and 2 per cent invariably killed the gonococcus in five minutes. In one experiment a few colonies survived immersion in a 1.5 per cent solution for five minutes. A 1 per cent solution did not kill the gonococcus in five minutes.

Benzyl alcohol is neutral in reaction, having a hydrogen-ion concentration of pH 7.0. Its germicidal effect is therefore not dependent on its acidity.

The antiseptic action of benzyl alcohol, together with its lack of toxicity, suggested its use as a gonococcicide in acute gonorrhœa. Work along this line is being carried on at present and will be reported later.

M. H. KAHN.

Stewart, G. N., and Rogoff, J. M.: The Action of Drugs on the Output of Epinephrin from the Adrenals. VI. Atropine; Pilocarpine. *J. Pharmacol. & Exper. Therap.*, 1920, xvi, 71.

The rate of output of epinephrin from the adrenals in cats is only moderately increased by atropine. The augmentation caused by pilocarpine, if any, is small and not comparable to the large increase caused by strychnine or that due to nicotine.

One of the authors' experiments indicated that pilocarpine is capable of producing a moderate depletion of the epinephrin store in adrenal glands with intact nerve supply.

SAMUEL KAHN.



**Oliver, J.:** Early Changes Following the Injection of Tubercle Bacilli into the Metaphysis of the Long Bones of Animals. *J. Exper. M.*, 1920, xxxii, 153.

It has long been recognized that tuberculous infection of the long bones originates in, and is in great part confined to, the metaphysis and epiphysis. In this localization it differs markedly from the diffuse process which follows infection with pyogenic organisms. The conjectures made to account for this fact have been many. Lexer's anatomical studies led him to believe that the embolic deposit of bacteria in the region of the metaphysis is favored by the course of the arteries, but Ely claimed that peculiarities in the structure of the bone marrow facilitate their growth. The experiments reported in this article by Oliver were carried out to determine the correctness of the latter theory. No attempt was made to infect the bone in a manner analogous to spontaneous infection in man, as the author's interest was concerned with the cellular reaction which followed the infection rather than the path of the infection.

Rabbits were given 20 ccm. of a 1 per cent solution of trypan blue intravenously, and two days later a trephine opening was made in the metaphysis of the tibia and one to two drops of a normal salt solution emulsion of bovine tubercle bacilli were injected into the marrow. Similar experiments were made with guinea pigs and tubercle bacilli of the human type. After intervals varying from three to nine days the animals were killed and portions of the bone were excised and fixed in 10 per cent formaldehyde. After fixation the sections made from the marrow which was removed from the bone and embedded in paraffin were appropriately stained.

The earliest changes were observed three days after the operation. No lesion was seen in the gross specimen, but a slight change was observed in the sections on low magnification. With a higher magnification it was seen that a large number of the leucocytes showed evidences of nuclear degeneration, while the reticulo-endothelial cells contained two or more nuclei and instead of being stellate in shape as normally, were rounded and lay free in the sinuses of the marrow. Another finding in these cells was the presence of clear areas free from dye granules which were believed to be vacuoles. In sections stained for tubercle bacilli it was possible to demonstrate one or more acid-fast bacilli. In somewhat later stages of the infection groups of from two to twenty vitally stained reticulo-endothelial cells were found.

A few giant cells were seen in the sections. These had the typical morphology of the Langhans type, and dye granules and vacuoles were visible in their clear protoplasm.

No attempt was made to follow the tuberculous process in its further development. In several animals which were allowed to live a month or until death, extensive tubercular lesions consisting of broad areas of caseation surrounded by granula-

tion tissue were found in the diseased bones. In this granulation tissue were many reticulo-endothelial cells still showing dye granules.

Though it explained the more frequent embolic deposit of bacteria in that region, the demonstration by Lexer of numerous anastomoses in the metaphyses of long bones did not explain the difference observed in the localization of a tuberculous process as contrasted with the diffuse lesion seen in pyogenic infections.

The author's experiments indicated that the observed difference was due to peculiarities in the structure of the infected tissue, the bone marrow. This tissue in the metaphyses of long bones, as contrasted with the fatty marrow of the diaphyses, is rich in the cells which are particularly concerned in the reaction to infection with tubercle bacilli.

G. E. BEILBY.

**Jones, J. P.:** Experimental Implantation of Foreign Tissue into the Lumen of Large Arteries. *J. Am. M. Ass.*, 1920, lxxv, 737.

Being interested in Herrick's report regarding the implantation of musculofascial strips into the lumen of arteries which was not followed by clotting, Dozier, Propst, and the author, while on the surgical service of Evacuation Hospital No. 36, A. E. F., France, made experiments to test the accuracy of these findings.

In one of their experiments, performed March 12, 1919, a young female mongrel dog, weighing 11 kgm., was anesthetized with morphine and ether. The abdomen was then opened by a 7.5 cm. incision in the midline, the intestines were pushed to the side, the right common iliac artery was isolated, and its blood current was arrested by two small clamps placed about 2 cm. apart. A fine silk suture was passed through the center of the artery by means of a small cutting needle, and by traction on this suture a small cataract knife was drawn through so that a slit about 3 mm. long was made in each side of the artery. The knife was then withdrawn and by means of the same suture a strip of muscle and fascia from the rectus abdominis, one-half the diameter of the lumen of the artery, was drawn through the slits so that it projected about 4 mm. on each side. A suture on each side was necessary to control slight bleeding proximal to the insert. The clamps were then removed and the pulse below was found to be of decidedly less volume than on the opposite side. The abdomen was closed in three layers. The animal made a rapid and uneventful recovery from the operation.

On June 2 the animal was anesthetized and the abdomen opened. The pulse was apparently of equal volume in each femoral artery. Except for some adhesions, the artery presented no external evidence of having been molested. One centimeter of the artery was resected. On being held to the light it presented a perfectly smooth and regular lumen with a band about one-fourth its diameter crossing its center from side to side. On examina-



tion this band was found to be smooth and glistening, and apparently covered with endothelium. There were no clots adherent to it.

Soon after making the necropsies the author was transferred to another hospital and the specimens were lost in moving. Therefore, no histologic examinations were made and the report is incomplete. Jones believes, however, that his results substantiated Herrick's findings and justified the following conclusions:

1. The insertion of foreign tissue into the lumen of an artery may not be followed by immediate absorption or the formation of a permanent clot.

2. Vessel walls may be sutured without intima-to-intima approximation.

In a further work on this subject Jones hopes to show whether or not a temporary clot is usually formed and whether the insert is ultimately absorbed.

G. E. BEILBY.

**Tatum, A. L.: A Study of the Action of Cocaine on the Splanchnic and Cervical Sympathetic Neuromuscular Mechanisms.** *J. Pharmacol. & Exper. Therap.*, 1920, xvi, 109.

A more prolonged and powerful vasoconstriction is produced by the intravenous injection of epinephrin after the injection of a very small amount of cocaine. The same synergistic action occurs apparently in pupillary reactions to epinephrin following the administration of cocaine.

Kuroda, in making a study of the effect of cocaine on various tissues innervated by the sympathetic system, the blood vessels, uterus, intestine, and urinary bladder, came to the conclusion that cocaine has no effect on such structures comparable to the effect of epinephrin, and that whatever action does occur is due to the direct action of the drug upon smooth muscle fibers which it first weakly stimulates and later paralyzes. He failed to find any other adequate explanation of the effects of cocaine on the iris than that they are due direct muscle action.

Tatum reports experiments done to ascertain whether the augmentation of sympathetic activity is a condition of increased neuromuscular irritability responding more powerfully to other types of stimuli or whether it is limited to epinephrin as an exciting agent. To obtain constancy of the stimulation energy the induction current was used.

After isolation of one splanchnic nerve in the dog under ether anesthesia, blood-pressure tracings were taken with minimal effective currents. After cocaine injections into the femoral vein the same stimulus produced a remarkably augmented blood-pressure response. Both the height of the pressure and the duration of the response were greatly increased.

It is seen from the tracings that an increased response occurred also in animals on which decerebration, double vagotomy, transection of the cord, and double adrenalectomy had been done.

From such a series of experiments the conclusion seems warranted that in this particular part of the

sympathetic nervous system the administration of cocaine increases the effects of electrical stimulation of the splanchnic nerve.

In the dog it was found that cocaine actually increases the amount of response of the peripheral vasoconstrictor mechanism in the nasal chambers. It was discovered also that such small quantities as 0.2 mgm. of cocaine in 1 ccm. of salt solution injected into the femoral vein of a dog weighing between 12 and 15 kgm. produced a very marked nasal vasoconstriction. This, however, was of short duration and often followed by a dilatation greater than that noted before the drug was given. After a relatively short period the volume returned to normal.

In two widely separated and unrelated systems of sympathetic nerves evidence was presented that cocaine renders the peripheral vasoconstrictor mechanism more irritable, as measured by the amount of constriction produced by a short period of a nearly minimal electrical stimulation.

Thus it is evident that cocaine increases the responsivity of the peripheral neuromuscular mechanism to an adequate stimulus and that the so-called synergism between epinephrin and cocaine as regards vascular constriction is not limited to the two drugs but that cocaine so affects the peripheral mechanism that such excitants as epinephrin and electrical stimulation produce responses in excess of either alone without cocaine.

M. H. KAHN.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Stromeyer, K.: The Treatment of Surgical Tuberculosis with the X-Ray** (Ueber die Behandlung der chirurgischen Tuberkulose mit Roentgenstrahlen). *Deutsche med. Wochenschr.*, 1920, xlv, 514.

The author discusses the results of X-ray therapy in 119 carefully selected cases in some of which the treatment has been completed and in others is still being continued. Permanent cure was proved by careful re-examinations which, as a rule, were made about thirty-one and six-tenths months after the patient was discharged. The object of the treatment is to cause the absorption of the tuberculous tissue gradually so that the connective-tissue formation can keep pace with it and abscess formation will be prevented. The results consist of a decrease in the signs of inflammation, the disappearance of granulation tissue from bone foci, ankylosis, and the depositing of lime salts.

The author emphasizes the importance also of general treatment, i.e., fresh air and sunshine, exact orthopedic measures such as fixation of joints by means of splints, the application of a plaster cast in cases of spondylitis, and extension in cases of involvement of the lower extremities (the latter is imperative in cases of recent tuberculosis of the hip and knee). The details of the technique used in the various forms of tuberculosis and the results are summarized in six tables.



The effect of X-ray therapy in tuberculosis of the glands of the neck is excellent. Of 14 cases of tuberculosis of the hip, 13 were cured, and in 9 cases of knee-joint involvement a cure resulted in 6. Favorable results were obtained also in involvement of other joints and in tuberculosis of bone, the peritoneum, and the soft parts. In involvement of the joints of the foot, however, a cure was obtained in only 50 per cent of the cases.

While in tuberculosis of the knee joint, X-ray therapy must be continued for about fourteen and seven-tenths months, it is usually effective in a much shorter time. A further advantage is that healing occurs with good function. The best results are obtained in young patients, but the method should be tried also in the treatment of older persons. The author recommends prophylactic radiation after operation when there is a possibility that recurrence may develop.

KRAUSS (Z).

### MILITARY SURGERY

**Wiesner, A.: Frost-Bite During the War and Its Treatment** (Erfrierungen im Kriege und ihre Behandlung) *Časop. lékař. česk.*, 1920, lix, 348.

This article is a résumé of the German literature on frost-bite and a report of cases treated at a hospital in a suburb of Prague during the war. In the spring of 1915 there were 282 cases of first and second degree frost-bite (involving the feet in 260, the hands in 4, and other parts of the body in 18) and 101 cases of third degree frost-bite (involving the feet in 93, the hands in 2, and other parts of the body in 6).

During the winter of 1915-16 there were 95 cases of the first and second degree (involving the feet in 77, the hands in 3, and other parts of the body in 15) and 33 cases of the third degree (involving the feet in 31, the hands in 1, and the ear in 1).

In frost-bite of the first degree lukewarm baths and painting with tincture of iodine proved to be the most effective measures. In cases of the second degree the treatment consisted of painting with iodine, the opening of blebs, the application of boracic ointment to superficial ulcerations, and, after healing, lukewarm baths. Frost-bite of the third degree was treated most conservatively. It was impossible to try the method recommended by

Noesske, i.e., incisions to re-establish the circulation, as the condition was too far advanced when the patients arrived.

As a rule when the foot was involved only a few toes were lost. Amputation of the foot and amputation of the leg were necessary in only 1 case each.

KINDL (Z).

### LEGAL MEDICINE

**Classification for Taxation of Physicians According to Length of Practice is Discriminatory and Invalid.** *Davies vs. City of Hot Springs (Ark.)*, 217 S. W. R., p. 769.

The State of Arkansas enacted a law to permit cities in that state, by proper ordinance, to require any person, firm, or corporation engaging in, carrying on, or following any trade, business, profession, vocation, or calling, to procure a license and pay a fee to be fixed. The City of Hot Springs enacted an ordinance which provided that for professional men (lawyers, physicians, etc.) the tax should be \$25 for all those in practice less than ten years and \$50 for all those who have practiced ten years or longer. Inasmuch as this portion of the ordinance was repugnant to the law itself, the court held that the city ordinance was invalid as to the \$50 license for those in practice ten years and over.

JOHN A. CASTAGNINO.

**Sufficient Evidence of Surgeon's Exceeding Authority.** *Wells vs. Van Nort (Ohio)*, 125, N. E. R., p. 910.

The purport of the testimony in this case was to the effect that prior to the operation the patient was in good health, but suffered an attack which was diagnosed by her physician as appendicitis; that the physician had asserted that the incision would be large enough merely for the insertion of two fingers; that the operation to which the patient consented was an operation for appendicitis; that no other operation was talked about or intended; and that while the patient was under an anæsthetic during the course of the operation the surgeon removed both of the fallopian tubes which he claimed to have found in a diseased condition. The case was ordered to be submitted to a jury.

JOHN A. CASTAGNINO.



## GYNECOLOGY

### UTERUS

**Stacy, L.: Radium Treatment in 600 Cases of Menorrhagia.** *Am. J. Roentgenol.*, 1920, n.s. vii, 379.

The author reviews 600 cases of menorrhagia, with or without fibroids, which were treated with radium at the Mayo Clinic from July, 1915, to January, 1920.

Answers to questionnaires were received from 438 patients. Sixty-nine of these were married women under 35 years of age. Normal full-term pregnancies occurred in 3 cases. Full-term dead fetuses were delivered in 2 instances, and miscarriages occurred in 3. One woman was pregnant six months at the time of reporting, and another was thought to be pregnant. The average dose of radium given to these 9 patients was 250 mg. hours, 2 tubes of 25 mg., or 25 mc., each tandem for five hours.

In 89 patients under 35 who were heard from, the menorrhagia was controlled by one treatment, an average of 293 mg. hours in 55.6 per cent. A second treatment was given 18 per cent of the patients, a hysterectomy was performed later on 6, and menstruation frequently ceased following 300 mg. hours of radium in 6.

Abdominal myomectomy is considered preferable to the use of radium in the treatment of women under 35 who have a definitely palpable fibroid as the operation interferes less with the function of the ovaries and uterus. General tonics, endocrine therapy, curettement, and even hysterotomy should be tried in the indicated cases in young women before large doses of radium are used.

Radium therapy is the ideal treatment for menorrhagia if the patients are more than 35 years of age and have a fibrous type of uterus or small fibroids. In the Clinic tumors larger than a four months' pregnancy are still considered surgical cases unless there is a definite contra-indication to operation.

In the 263 patients heard from who were more than 40 years of age menstruation ceased in 185 (70.35 per cent). It became regular and normal in 11.17 per cent. Subsequent hysterectomy was done in 15 cases.

If the history is suggestive of carcinoma of the fundus an abdominal hysterectomy is the safer procedure, even if a diagnostic curettement fails to reveal the presence of malignancy.

**Martindale, L.: Intensive X-Ray Therapy Versus Hysterectomy for Fibromyomata of the Uterus.** *Am. J. M. Sc.*, 1920, n.s. vii, 97.

This study is based on 93 cases, 51 of which were operated upon, 37 treated by intensive roentgen

therapy, and 5 treated by hysterectomy after the roentgen treatment. In 39 per cent of these cases, therefore, the author chose roentgen therapy, but in examining the cases in which he performed hysterectomy he found that no fewer than 6 out of the 47 could have been treated by roentgen rays just as satisfactorily. Accordingly it is probable that roentgen therapy would give satisfactory results in 46 per cent.

The technique employed was that advocated by Kroenig and Gauss of Freiburg, modified slightly since January, 1919, by the use of the Coolidge tube. Crossfire was employed from twenty to twenty-two ports of entry, eighteen anterior and from two to four posterior. A 3 mm. aluminum filter was used and in addition four sheets of stout photographic paper in a linen bag to absorb the secondary rays produced in the filter. The anode-skin distance was 18 cm. Seven minutes' treatment was given with a well-working tube (10 Wehnelt) for each area, eight minutes if lower than 6 milliamperes (for Mueller rapid tube), and three minutes with a Coolidge with hardness 8 and 4 milliamperes. It took from three to four hours to ray from twenty to twenty-two fields or from two to three hours with a Coolidge, but this was done on two consecutive days. The treatment was repeated after an interval varying from seventeen to twenty-one days, and irrespective of the menstrual period. On an average, seven treatments were given. The dosage was measured by the use of Kienboeck's strips. The average total dosage given each patient was 2,971 X units.

Cases regarded more suitable for roentgen therapy than operation were those in which the size of the tumor did not exceed that of a six months' pregnancy, the fibroid was interstitial, and menorrhagia was the prominent symptom. In cases in which the fibroid or fibroids were definitely pedunculated, submucous fibroids or a malignant condition were suspected, or the tumor exceeded the size of a six months' pregnancy a hysterectomy was done. When the patient was suffering from a serious form of heart disease in addition to a profound anæmia, the result of profuse menorrhagia, roentgen-ray therapy was chosen even if the uterus exceeded the size of a six months' pregnancy. To a certain extent also the patient's profession had a bearing on the choice. Roentgen therapy need not interfere with the patient's regular work and produces a menopause with fewer symptoms than a normal climacteric. The relative expense incurred is another factor which may influence the choice.

In the large majority of cases treated with the roentgen ray there were no unpleasant effects. In only 5 instances was there any roentgen jammer, and in 3 of these this did not come on until the later



treatments. In the remaining 2 it occurred after the first treatment. As a rule the patients continued to feel better, but probably this was due primarily to the disappearance of the anæmia. In a good many of the cases systematic blood counts were taken. Three and one-half hours after treatment there was a marked leucopænia but this gradually lessened until at the end of forty-two hours the count was within 2,000 of the normal. The later results, as far as could be ascertained, were equally satisfactory.

The author draws the following conclusions:

As long as the diagnosis necessarily remains faulty there is danger in using intensive roentgen-ray therapy for any but cases which it is fairly certain are straightforward uncomplicated cases in which the uterus is under the size of a six months' pregnancy, the fibroids are interstitial rather than sub-peritoneal, and the chief and only symptom is excessive menorrhagia. In such cases roentgen therapy is the treatment of choice. It is to be preferred also in cases of grave heart disease, in which it causes a marked improvement in the general health. Whenever the diagnosis is at all doubtful an exploratory laparotomy followed by hysterectomy, when necessary, is indicated.

Roentgen-ray treatment may be looked upon as the best treatment for all small uterine fibroid tumors associated with hæmorrhage. It improves the patient's health without interfering with her usual mode of life. It causes a marked reduction in the size of the tumor and therefore does away with pressure symptoms. It eliminates the nervous shock of an abdominal operation and the inconveniences of an anæsthetic, and brings about a climacteric involving less disturbance than even the natural menopause. Most important of all, it is a treatment eminently successful in suitable cases—according to Gauss, in 99 per cent of cases, and according to the results here reported, in 97.4 per cent of cases—and it is free from mortality.

Short histories of all the cases treated with the roentgen ray are appended. ADOLPH HARTUNG.

Mayer, A.: The Results of the Freund-Wertheim Operation for Carcinoma (Was leistet die Freund-Wertheim Carcinomoperation?). *Zentralbl. f. Gynaek.*, 1920, xliv, 617.

This article is a report of the results obtained with the Freund-Wertheim operation in the Tuebingen Clinic in the fifteen years from Jan. 1, 1902, to Jan. 31, 1916. In this period of time 893 cases of carcinoma of the uterus were observed. Of these, 725 (81.2 per cent) were cases of carcinoma of the cervix, and 168 (18.8 per cent) cases of carcinoma of the fundus.

Of the 725 cases of carcinoma of the cervix 251 (34.7 per cent) were inoperable, and 474 (65.3 per cent) operable. In 457 cases operated upon there were 93 operative deaths (20.3 per cent), 50 deaths due to peritonitis, 12 due to pyelitis, 7 due to pneumonia, 10 due to embolism, and 14 due to

anæmia and cachexia. There were 364 primary cures (79.7 per cent).

Of the 545 cases of carcinoma of the cervix observed between Jan. 1, 1902, and Jan. 31, 1912, 192 were inoperable and 353 operable. In 345 cases operated upon there were 68 operative deaths and 275 operative cures. Of the 275 patients who were cured by the operation 3 disappeared and 165 had a recurrence or died of some unknown cause and are believed by Winter to have had recurrences within five years. One hundred and seven remained free from recurrence for at least five years. These figures show that of the 272 women who were discharged as cured after the operation 107 remained free from recurrence at least five years later (39.3 per cent of permanent cures), and of 532 women whose subsequent condition is known, 107 remained free from recurrence longer than five years (20.1 per cent of absolute cures).

Of the 168 cases of carcinoma of the fundus, 38 (22.6 per cent) were inoperable and 130 (77.4 per cent) operable. In 125 cases operated upon there were 12 operative deaths (9.6 per cent) and 113 operative cures.

Of the 132 cases observed in the period from Jan. 1, 1902, to Jan. 31, 1912, 106 were operable. In 102 cases operated upon there were 8 operative deaths and 94 operative cures. Four of these patients disappeared. Thirty-four died of recurrence or of some unknown cause within five years and 56 remained well longer than five years. According to Winter's interpretation of these figures it appears that of 90 women discharged as cured after operation 56 remained free from recurrence longer than five years (62.2 per cent of permanent cures), and of 124 women whose subsequent condition is known 56 remained well longer than five years (45.2 per cent of absolute cures).

REINHARDT (Z).

#### ADNEXAL AND PERI-UTERINE CONDITIONS

Rubin, I. C.: The Non-Operative Determination of the Patency of the Fallopian Tubes by Means of Intra-Uterine Inflation with Oxygen and the Production of an Artificial Pneumoperitoneum (Continued). *J. Am. M. Ass.*, 1920, lxxv, 661.

The determination of the patency of the fallopian tubes has been possible hitherto only after laparotomy. Accurate knowledge regarding the anatomical patency of the tubes is important in the formulation of the prognosis and therapy of female sterility. A method whereby tubal patency may be demonstrated without surgical means is therefore eminently desirable. Such a method has been found in the combination of intra-uterine oxygen inflation, fluoroscopy, and roentgenography. The artificial pneumoperitoneum establishes the patency of the fallopian tubes definitely.

Observations are drawn from 70 cases. The pain of the procedure is no greater than that associated with the introduction of a uterine sound. The



passing of oxygen into the peritoneal cavity is painless. There is some sense of pressure about the diaphragm and a slight sticking sensation in one or both shoulders. When between 100 and 200 ccm. are injected, the symptoms are very slight and do not interfere with the patient's daily routine. There are no pelvic symptoms after the gas inflation. In no case was there evidence of peritoneal irritation or peritoneal infection.

Artificial pneumoperitoneum gives conclusive evidence regarding the patency of at least one tube. A negative result is not enough to establish non-patency. The test should be repeated once or twice, more oxygen being used.

The technique of the test is very simple. The instruments necessary are: (1) a metal cannula of the Keyes-Ultzman type with several small apertures at the tip; (2) a tenaculum; (3) a uterine sound; (4) a dressing forceps; (5) a bivalve vaginal speculum; and (6) an oxygen tank connected with a water bottle containing sterile water or a weak antiseptic solution. The stopper of the water bottle has three openings through which three glass tubes are passed. One of these tubes extends below the level of the solution and is attached to the oxygen tank. The other two do not extend down to the solution level. One is attached to a mercury manometer and the other is connected with the cannula to be inserted in the uterine canal. The rate of flow of the oxygen is so managed that not more than 300 distinct bubbles rise in the solution in the water bottle per minute. The actual amount of oxygen flowing per minute is determined by displacing water from one bottle to another.

The cervix is located with the speculum and steadied with the tenaculum. Mucus is removed from the cervical canal and the cervix is painted with iodine. The cannula is then inserted beyond the internal os. A rubber urethral tip strung on the cannula is then inserted into the external os to close it more tightly if it is patent.

When the fallopian tubes are patent the pressure, as noted in the manometer, first rises for from one-half to three-quarters of a minute, then fluctuates for a few seconds, and then drops from 10 to 30 points.

When the tubes are not patent the pressure rises and then drops sharply as the oxygen regurgitates through the external os.

In cases of patent tubes the gas is allowed to flow for from one-half to one minute from the time the pressure drops in the manometer. From the time of the beginning of the flow of the gas the cannula is never withdrawn under one minute and a half. The average pressure of gas is between 60 and 80 mm. Occasionally, however, it rises to 100 mm. before oxygen passes the uterine ostium.

When the pressure reaches 150 it is probable that the lumen is closed completely or stenosed. A pressure of 200 mm. indicates with great certainty that the tubes are closed. If the pressure reaches 200, the needle valve is opened to keep it from

rising higher. Fluoroscopy should always be used to check up in the examinations when partial stenosis is present.

When the tubes are patent the oxygen is seen in the fluoroscopic picture as a clear space below the diaphragm on one or both sides. The diaphragm appears as a transverse septum above the dark liver shadow on the right side and over the pale stomach margin on the left side. The entire examination is completed in five minutes. The best time for the examination is ten days following a menstrual period. Just before or after menstruation a little bloody oozing may follow the withdrawal of the cannula.

Contra-indications to the use of the method are the presence of acute or subacute pelvic infection and purulent disease of the cervix, vagina, Bartholin's glands, or urethra.

R. T. LAFAVE.

#### Richardson, E. H.: Ovarian Function Following Hysterectomy. *South. M. J.*, 1920, xiii, 595.

The author states that he is emphatically opposed to the teaching that ovarian function is destroyed *in toto* by the surgical removal of the uterus. He believes that such teaching is dangerous and without scientific justification. He condemns the removal of one or both ovaries at any age simply because hysterectomy is necessary.

Clinical studies both of cases of total ablation and cases in which the ovaries were retained have been on the whole unsatisfactory and have led to conflict of opinion regarding the value of the conserved ovary. This is due to the fact that such studies have not been undertaken with proper regard for all of the various factors which in reality determine the fate of retained ovaries. Without a knowledge of these it is impossible to estimate clinically with any degree of accuracy the extent to which hysterectomy has disturbed the ovarian function.

Studies should be based on: (1) a knowledge of the patient's condition prior to hysterectomy, both in the psychic domain and in that of the autonomic nervous system; (2) a grouping of the cases according to age both at the time of operation and at the time of subsequent observation; (3) a further grouping of the cases according to the pathology for which the operation was performed and a careful descriptive note on the condition of the retained ovary; and (4) a record of the operative technique sufficiently detailed to permit accurate determination of whether or not proper measures were employed to safeguard subsequent ovarian circulation.

As far as they go, available clinical data are overwhelmingly favorable to ovarian retention, but more scientific observations along the lines suggested is necessary.

Richardson believes that while the influence of the uterus upon the ovaries is not of any great importance, the interrelationship of the endocrine system must not be lost sight of. This extra-genital function of the ovary is most important.



The normal growth and development of the genital tract, together with that of the whole group of secondary sex characteristics occurring at puberty, is known to depend largely upon trophic influences of the ovary. It is known also that ovarian influence controls the development of the mammary glands and is responsible for the cyclic changes which they manifest. Furthermore, abundant evidence, both experimental and clinical, is available to establish incontrovertibly the intimate and vital connection of the ovaries with other units of the endocrine system. Particularly is this true of the pituitary, the thyroid, and the adrenal glands.

EUGENE CARY.

**Himwich, H. E.: Rhabdomyoma of the Ovary.**  
*J. Cancer Research, 1920, v, 227.*

As tumors of striated muscle are rare, a new and characteristic case is worthy of record. The rhabdomyoma described by Himwich is of special interest because of the peculiar forms assumed by the myogenic cells and the wide variations in the structure of the tumor.

The patient was a child 1½ years of age who had a mass in the abdomen reaching half way to the umbilicus. In size and shape this mass resembled a kidney with the long diameter horizontal. It was freely movable. There were no subjective symptoms. Early in February, 1919, the child began to vomit to such an extent that the mother consented to an operation. At that time the mass appeared to fill the abdomen up to the umbilicus and a yellowish discoloration of the skin appeared in the region of the umbilicus.

The operation, performed February 9, 1919, disclosed a well-encapsulated tumor which arose apparently from the region of the left ovary and filled the pelvis. A narrow upper portion lay under the lower surface of the liver. The capsule was attached to the anterior abdominal wall posterior to the umbilicus. The entire new growth was removed. During its removal, however, the capsule was broken and some of the myxomatous tissue fell into the abdominal cavity. The child died of abdominal recurrence May 31, 1919.

The tumor was covered by a thin movable capsule and consisted of two parts, a lower, hard, spherical mass, 11 cm. in diameter, and an upper myxomatous portion, 4 cm. in diameter. It weighed 26 oz. The surface was smooth and presented various rounded protuberances. On section of the larger portion the capsule was seen to run inward from the surface in thin strands. The tumor was made up of rounded masses varying in diameter from 3 cm. to a few millimeters, a fact which suggested that it grew by the formation of new parts as well as by the increase in size of the older portions. On section the myxomatous division was found to contain a cavity.

Of the histologic features the most striking were the giant cells. Most of these had an acidophile cytoplasm containing concentric striæ which were

most predominant at the periphery. The perinuclear cytoplasm was granular. The nucleus or nuclei were round or broadly oval. Some of them contained from 1 to 3 nucleoli. In other cells one or more centrosomes gave evidence of active mitosis.

Certain areas in the tumor were composed of long cells with the characteristics of muscle fibers. The nuclei were oval and usually situated in the median axis. The peripheral cytoplasm was fibrillated but only rarely were any cross striations made out. Some of the fibers were branched.

In several areas star-shaped cells with nuclei the size of those seen in the muscle fibers and fibrils extending radially from them could be seen separating the muscle fibers. In other areas the tumor had a distinctly myxomatous appearance.

In summarizing the case Himwich states that three elements arose from one tissue by: (1) more or less normal histogenesis, (2) anaplastic development, and (3) degenerative changes. Although only one tissue, cardiac muscle, was present, the tumor was of teratomatous origin. In the author's opinion many simple tumors of the ovary and tumors of the head, neck, thorax, genito-urinary tract, and posterior pelvic regions are of teratomatous origin. In this group he includes the great majority of the heterologous neoplasms and some of the homologous neoplasms.

Teratoma is a twin inclusion. As in the tumor described a group of cells which appear only in rhabdomyoma of the heart was found, the author concludes that the growth was a rhabdomyoma of the heart of twin inclusion. Fibrils were produced in such overabundance that they lost connection with their nuclei and seemed to be multiplying independently. Myxoma was secondary to rhabdomyoma.

G. E. BEILBY.

#### EXTERNAL GENITALIA

**Stein, A.: Syphiloma Vulvæ.** *Surg., Gynec. & Obst., 1920, xxxi, 227.*

Stein makes a very valuable contribution to our knowledge of a tertiary luetic lesion of the vulva and urges the substitution of "syphiloma vulvæ" for "lupus vulvæ" and other misleading terms.

Syphiloma vulvæ usually occurs many years after the primary lesion and is apt to supervene in the absence of all other specific signs after a long interval of apparent good health. Thus many errors in diagnosis have been made. The author calls attention to the statement of Hyde that women, far more frequently than men, are the bearers of isolated syphilitic lesions.

Syphiloma vulvæ is a slowly progressive indurated tumor causing no pain and giving rise to no inconvenience except that due to its size. The skin has a peculiar dry hardness without oedema. It is pinkish or red in color and one writer has noted that it feels as if it were lined with parchment. The swollen and indurated areas of the vulva become the seat of deep ulcerations which show no predilection as to



location. When well developed, the lesion involves the labia majora on both sides more or less symmetrically, in shape resembling a horse collar. As a rule the labia majora and the clitoris are also attacked by the hypertrophic and ulcerative process. The vestibule region is thickened or deeply ulcerated and interspersed with irregular nodules. In some cases fungosities are present. The luetic process may extend to the anal region and well within the vagina.

A local lesion not unlike the syphilitic lesion described is formed by tuberculosis and malignant changes. If the tubercle bacillus is found, the disease is lupus and not in any way related to syphiloma vulvæ. Primary malignant disease of the vulva is rare and of more rapid growth than the luetic lesion. Microscopic examination of the tissues may be necessary definitely to determine the presence of malignant disease. The statement made in recent publications that syphiloma vulvæ is of obscure origin and does not respond to treatment for syphilis is challenged by Stein who claims that syphilis is always the cause of this condition and the lesion responds to specific treatment combined with operative removal even when the characteristic signs of syphilis are not demonstrable.

Histologically a syphiloma consists of a collection of round cells closely resembling those of inflammatory neoplasms with a scanty blood supply. While in their early stages, syphilomata may resemble condylomata, those attaining a large size have a more variegated structure, containing plasma, epithelioid and round cells of the lymphocyte type with extensive caseation. The changes may then be confused with those due to tuberculosis but may be differentiated if the following facts are borne in mind:

1. In the syphiloma epithelioid cells are usually less numerous than the granulation cells and the plasma cells.

2. Fibroblasts and fibrillar connective tissue are apt to be conspicuously represented in the syphiloma but in tubercles they are demonstrable only exceptionally.

3. Caseation is more extensive in the syphiloma.

Clinically the disease is characterized chiefly by absence of pain, non-interference with the general health, and disproportion between the local changes and resulting disturbances. There is little tenderness on pressure and the usual signs of congestion are absent.

The treatment is both surgical and medical. The surgical care calls for the excision of all tumors and excrescences and the destructive cauterization of ulcerating areas. Intravenous injections of salvarsan are also essential.

The prognosis is as favorable as that of gummatous tertiary lesions elsewhere.

The author concludes that in view of the long-standing character of the specific infection in the majority of cases a positive Wassermann test is not essential.

W. H. CARY.

## MISCELLANEOUS

Wintz, H.: A Critical Review of X-Ray Treatment in 1919 (Die Strahlentherapie im Jahre 1919, ein kritischer Bericht). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1920, li, 331, 415.

The X-ray treatment of cancer of the female genital organs has made great advances and has been found to be of great value. In the treatment of cancer of the cervix the use of radium with the X-ray is necessary to effect a cure.

The author reviews the literature to show the methods of various roentgenologists and their results. In addition to endeavors to destroy cancer cells by the X-ray, attempts have been made also to increase the local and general resistance of the tissues. To improve the general resistance of the body Wernekros advocates blood transfusion in addition to the X-ray treatment in the cases of anæmic patients. To increase the local resistance Teilhaber has proposed the use of diathermy to produce an inflammatory reaction in the pelvic connective tissue. He believes that as a result of such treatment the round-cell infiltration will aid in preventing the recurrence of the carcinomatous tissue.

After mentioning a few cases in which successful results were obtained with the X-ray in the treatment of sarcoma, Wintz discusses the treatment of myomata and metrorrhagia. Fuchs holds that the X-ray affects the tumor growth indirectly by its influence on the ovarian tissue rather than directly. The research of Seitz and Wintz has revealed the following facts:

1. The X-ray is more effective when used shortly after menstruation than when used before menstruation. This fact may be explained by the hypothesis that after menstruation either a ripe follicle or a young corpus luteum is acted upon, while after the menses the ovarian hormone is circulating in the blood.

2. Interruption or division of the dosage delays the effect.

3. In early pregnancy X-ray treatment may injure the embryo.

Because of the resultant severe injury to the bowels and bladder, Weibel discontinued the prophylactic use of the X-ray following operation after he had employed it in 260 cases.

In conclusion the author reviews the recent literature regarding the dangers of X-ray burns and gas poisoning in X-ray rooms, points out the difficulty in determining the proper dosage for deeply seated organs, and discusses the advantages and disadvantages of the various X-ray tubes in common use.

SEIERS (Z).

Dorland, W. A. N.: The Treatment of Gonorrhœa in Women by the Methylene-Blue Process. *Illinois M. J.*, 1920, xxxviii, 114.

In the author's opinion gonorrhœa in women is readily curable in the great majority of cases, and



if all parts of the genital mucosa were more readily accessible, the infection of these surfaces could be cured in from twenty-four to seventy-two hours.

Notwithstanding the statements of text-books, Dorland believes that gonorrhœal urethritis in women is a rare condition clinically. In about 20,000 women examined gonorrhœal involvement of the urethra was noted in only a comparatively few.

In the treatment of gonorrhœa in women numerous agents have been used, but most of them have soon been found ineffectual. Those which have stood the test best are the salts of mercury, picric acid, various forms of silver, tincture of iodine, carbolic acid, and lysol.

Two microbicides of the coal-tar group of derivatives which are not so generally known to the profession but are worthy of special attention, are methylene blue and acriflavine. During the past fifteen years the author has used methylene blue locally in the treatment of a very large number of cases of gonorrhœa. The results have been astonishing and most gratifying. His technique is as follows:

After thorough cleansing of the affected parts—the vagina, the cervical canal, and the urethra—with plain sterile water or warm normal salt solution, the surfaces are well dried. A cotton-wrapped aluminum probe, or a small pledget of cotton held in the grasp of a uterine dressing forceps and saturated with the 1 per cent aqueous methylene-blue solution is then carried to the internal os uteri. If this is closed, as is usually the case, the application is stopped at this point, but if it is patulous the instrument is carried to the uterine fundus.

The dye having been rubbed in thoroughly, the instrument is withdrawn. A larger loose pledget of cotton held in the grasp of the dressing forceps is then saturated with the solution and the entire external surface of the cervix and the vaginal mucosa are bathed profusely in the blue down to the ostium vaginæ. The excess of the solution is squeezed out by pressing the pledget of cotton upon the valve of the speculum, and the lake of fluid thus obtained is emptied into the vagina as the speculum is withdrawn. A pledget of cotton held at the posterior commissure of the vulva catches the fluid as it escapes from the vagina, and the patient is instructed to bear down in order to expel the remainder of the solution. Special care is taken to carry the blue into the fornices of the vagina and to paint the

lateral vaginal walls which protrude between the valves of the speculum.

As a result of an application made in this manner the entire mucous surface of the cervix and vagina and lower part of the vestibule is painted a blue-black color. This color largely disappears in from twelve to twenty-four hours. If an associated specific urethritis is present, a small cotton-wrapped probe saturated with the blue is carried by a gentle rotary movement as far as the mouth of the bladder. In none of the author's cases has it been necessary to make more than two or three urethral applications. As a rule the ardor urinæ ceased with, or shortly after, the first application.

The patient is told not to use a syringe the night of the day of the treatment but to use it twice daily with plain hot water, as hot as she can bear it without discomfort, on each succeeding day until the next visit. Two such treatments in a week will generally effect a cure in from five to six weeks.

C. H. DAVIS.

**Eymer, H.:** *The Treatment of Benign Gynecological Hæmorrhages with Radioactive Substances* (Ueber die Behandlung gutartiger gynaekologischer Blutungen mit radioaktiven Substanzen). *Strahlentherapie*, 1920, x, 900.

This report is based on 140 cases. The conditions treated were metropathia hæmorrhagica occurring during active sexual life, metropathia hæmorrhagica preclimacterica, metropathia climacterica, and myomatosis uteri. All patients who were treated for seventy-two hours became amenorrhœic and therefore cured. Forty-eight-hour raying did not bring on amenorrhœa in every case. Still shorter exposures offered no certainty of success.

Occasionally cases of hæmorrhages not influenced at all by the X-ray were affected favorably. Intra-uterine raying frequently was associated with bowel disturbances but these generally disappeared in a week. Cramp-like pains developed occasionally and generalized indisposition, but these also passed away in a short time. The same was true of increases in the temperature. In several cases peritoneal irritation was observed. The symptoms of dysfunction were not as severe as in X-ray treatment. The author is so well satisfied with the results that he would not willingly be without the method.

SILBERG (Z).



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Holland, E.: Rupture of Cæsarean Section Scar in Subsequent Pregnancy or Labor. *Lancet*, 1920, cxcix, 591.

The occurrence of 5 cases of rupture of the uterus in a cæsarean section scar led the author to investigate the literature and records of the London Hospital and the City of London Maternity Hospital and to make a survey by questionnaire of all cases occurring in England in the practices of obstetricians.

In the first of the 5 cases mentioned the cæsarean section was performed because of a contracted pelvis. The uterus was sutured with chromic catgut and convalescence was normal. One year later a subtotal hysterectomy was done because of rupture of the cæsarean scar during pregnancy. Good recovery followed.

The second patient was operated on first because of eclampsia. The uterus was closed with chromic catgut. The convalescence was febrile and the scar ruptured in the eighth month of the second pregnancy. Subtotal hysterectomy was done with fatal outcome. The scar, which was very thin, consisted of stretched peritoneum. The placenta was implanted over it.

The third patient was subjected to cæsarean section during her third pregnancy because of a contracted pelvis. The uterus was sewed with chromic catgut and convalescence was febrile. A second operation was performed in the fourth labor as the scar ruptured in its entire length. Subtotal hysterectomy resulted in good recovery.

In the fourth case the cæsarean operation was performed in the patient's fourth labor because of contracted pelvis. Chromic catgut was used for the uterine suture. The convalescence was febrile. In the fifth labor this patient was delivered by forceps and her convalescence was again febrile. In her sixth pregnancy spontaneous rupture occurred in the eighth month; the placenta was implanted in the area of scar and at operation was found in the peritoneal cavity. The ruptured scar included the whole length of the former scar and extended laterally at both ends. Closure of the rupture was followed by uneventful recovery.

In the fifth case the first cæsarean section was done because of eclampsia. Silk suture was used to close the uterus, and the convalescence was febrile. The second pregnancy was terminated by premature labor followed by puerperal sepsis. Fever continued until death. At the time of delivery the placenta was removed manually. A third-degree laceration of the perineum had occurred. The correct diagnosis was made at autopsy. The peritonitis was due to

rupture of the uterus and subsequent perforation of the bowel with abscess formation. It was not known whether the rupture took place during labor or during the removal of the placenta, but the author believes that it occurred during labor and was the cause of the difficulty in the removal of the placenta.

Of 92 cases reported in the literature rupture occurred in 54 in the second pregnancy, in 19 in the third, in 10 in the fourth, in 6 in the fifth, in 1 at eight and one-half months, in 10 at eight months, in 1 at seven and one-half months, and in 8 at seven months. In 48 of the 92 cases it occurred during labor and in 36 before the onset of labor. In the reports of 13 cases the time was not mentioned.

A study of the scar showed that perfect healing often resulted in complete regeneration of the muscle tissue. The thin scars may be of the type in which there is thinning throughout the entire length. In extreme cases the scar consists of peritoneum in contact with the decidua. The point of greatest importance with regard to these scars is the complete failure of union of the uterine muscle. The extreme thinning may occur in a portion or throughout the entire length of the whole scar. There may be partial union of the muscle or only a very thin scar. The ruptured scars no doubt are those in which a pre-existing thin scar formed the site of weakness. A moderately thick scar, whether fibrous or muscular or both, will not rupture except under extreme tension.

The unknotting or cutting through of the suture, by which local sepsis is begun, often contributes to the incomplete healing of the scar. Five cases were noted in which a utero-abdominal fistula occurred. The site of the incision in the uterus, which was mentioned in 85 case records was anterior median in 55 instances, transverse in the fundal area in 28, and cervical in 1. The number of ruptures was relatively higher in the transverse incision than in the median incision. At the present time the cervical incision shows the lowest incidence of rupture.

The placenta was implanted over the scar area in 34 cases and elsewhere in 17. The location of the placenta over the scar contributes to rupture, but in the past too great importance has been given to this point. By far the chief predisposing cause of rupture is sepsis which interferes with the healing of the scar.

In deciding as to the management of future pregnancies following cæsarean section importance must be attached to the febrile condition present at the operative convalescence. Of 66 patients, only 15 had an afebrile convalescence. In some cases accidental factors, twins, hydramnios, retroplacental hæmorrhage, operative deliveries, and bagging



operations serve as a cause of rupture. Intervening labors are also predisposing factors.

The time at which rupture occurred was at or within a month of full term in 70 of 87 cases. The rupture occurred during labor in 48 of 84 cases and of these 48 cases it occurred in the first stage of labor in 29. In 36 of the 84 cases it occurred before the onset of labor.

Attention is drawn to the infrequency of the typical symptoms of rupture of the uterus in patients with cesarean section scars. The severity of the symptoms is dependent on the position of the placenta, as there is apt to be marked hæmorrhage when the implantation is over the scar. Acute symptoms are not to be expected in partial rupture if the ovum is still in the uterus.

Tabulated results of the inquiry and follow-up reports include 1,103 cases. In 487 of these there were subsequent pregnancies. In 78, delivery was effected by the pelvic route; in 352, cesarean section was repeated; and in 18, rupture of the scar occurred. The frequency of rupture amounted to 4 per cent. The proportion of ruptured scars to the number of patients delivered normally following cesarean section is about 1:4. The determination of the number of ruptures following the use of catgut as compared with those following the use of silk showed that the frequency of the former is two and one-half times that of the latter. The author therefore emphasizes the danger of using catgut in closing the uterine wound and recommends silk as the most suitable material. As predisposing causes of rupture of the scar attention is directed to imperfect healing, thinning due to subsequent pregnancies, overdistention of the uterus, obstructive labor, and infection.

W. N. ROWLEY.

**Kosmak, G. W.: Necrotic Fibroids Complicating Pregnancy and the Puerperium.** *N. York State J. M.*, 1920, xx, 259.

The author gives the reports of five cases of necrosis of fibroids occurring during pregnancy and the puerperium and illustrates the advisability of radical treatment when evidences of a breaking down of the tumors are noted. His conclusions are as follows:

1. Patients with myomatous tumors of the uterus associated with pregnancy must be carefully watched for evidences of local necrosis during the entire period of pregnancy and the puerperium, as the breaking down of the tumor may occur at any time during these periods.

2. If necrosis is present in such cases the possibility of operation must be considered.

3. Exploratory laparotomy under deep anesthesia with enucleation of the growth and careful suture of the uterine wall can be carried out without extensive hæmorrhage, the production of abortion, or premature delivery if the patient is kept well narcotized after the operation. Although recommended by various authors, hysterectomy is not always necessary. Even if abortion follows the

operation, the uterus will be left for possible future pregnancies.

4. Uterine myomata undergoing degeneration during the puerperium, as shown by local pain and tenderness, elevation of temperature, continuous red lochia, and possibly signs of peritonitis, should be considered for exploratory operation in the hope that the tumor may be enucleated before perforation of its capsule takes place. This procedure must be followed also when the growths are pedunculated. When multiple fibroids are present hysterectomy must often be considered.

C. H. DAVIS.

#### PUERPERIUM AND ITS COMPLICATIONS

**Gow, A. E.: Intravenous Protein Therapy in Puerperal Septicæmia.** *Brit. M. J.*, 1920, ii, 268.

In the treatment of puerperal septicæmia an attempt is made to destroy bacteria or their toxins. As specific agents sensitized vaccines and sera may be used, and as non-specific agents, peptone and foreign proteins. The best results are obtained by the combined method. The author uses Witte's peptone which contains 32 per cent of primary albumose. He has not employed Allen and Hanbury's preparation as in experiments on rabbits it was found to be more toxic. A solution is prepared by adding 5 ccm. of hot, freshly distilled water to 10 gm. of peptone and thinning the paste by adding distilled water until 50 ccm. is reached. A little sodium carbonate is then added and the mixture boiled while being well stirred. After it is rendered sterile it is filtered while hot and the filtrate placed on a boiling water bath for twenty minutes. When cool, it is sealed.

The initial dose, from 8 to 10 ccm., is increased 2 ccm. every other day until 20 ccm. are given. The intravenous injection is given slowly by means of a record syringe and a fine needle (No. 28), and the pulse rate is carefully noted every quarter minute. The occurrence of a rigor is of good import.

This treatment helps to localize the process in acute cases and must be regarded as complementary to treatment by autogenous or stock sensitized vaccines. Gow considers the uterine swab better than the blood culture for the preparation of autogenous vaccine. The vaccine may be given subcutaneously in doses of 100, 250, and 500 million on three successive days; a larger dose of 500 million may be given intravenously. If the serum used to sensitize the vaccine is given intramuscularly at the same time, a rigor may be produced with marked benefit.

Vaccines and sera are given best when the patient is fasting.

J. W. ROSS.

**Murray, H. L.: Sera and Vaccines in the Treatment of Puerperal Infection.** *Brit. M. J.*, 1920, ii, 269.

In summarizing the present-day knowledge of sera and vaccines in the treatment of puerperal infections Murray states that this type of treat-



ment is not yet sufficiently well established to justify implicit trust in it.

Attention must be paid to details and due regard given to the patient's condition, the amount of serum or vaccine administered, and the method of administration. A few cubic centimeters of serum given subcutaneously to a moribund patient will neither prove nor disprove the efficacy of the method.

The first essential is a correct diagnosis in order to exclude such factors as pyelitis, untreated lacerations, and peritonitis. Peritonitis requires surgical care.

Treatment must be instituted early and an effort made to isolate the organism. In a series of 196 patients with puerperal sepsis 46.4 per cent gave a positive blood culture and in 93 per cent the organism was proved to be a streptococcus. A carefully taken blood culture is the best means of obtaining material for an autogenous vaccine. Time should not be lost, however, in waiting for such a vaccine. Antistreptococcus serum should early be diluted with an equal volume of normal saline and given intravenously in large doses (50 ccm.). If no improvement is noted in from twelve to twenty-four hours it is well to repeat the dose, using a different brand of serum. An antistreptococcus serum, being bacteriolytic, requires a complement, and it may be advisable to give 5 ccm. of fresh sterile guinea-pig or horse serum.

Murray does not advocate the use of stock vaccine except in an emergency. In some cases autogenous vaccines have proved themselves of definite value. One observer reduced his mortality from between 85 and 95 per cent to 55 per cent by this means. The doses given should be small and, in streptococcal infections, given preferably with serum. Treatment with immunized serum appears of value in cases of pyæmic infection.

The author withholds judgment regarding the relative values of vaccines prepared by heat or antiseptic, and detoxicated vaccines. Treatment must not be instituted on a definitely fixed scale, but should be varied to suit the case. The use of partially devitalized bacteria in a vaccine is open to objection.

J. W. Ross.

**Whitehouse, B.: The Surgical Treatment of Puerperal Sepsis.** *Brit. M. J.*, 1920, ii, 267.

The author advances his application of the Carrel-Dakin method in the treatment of puerperal sepsis in combination with curettage. Hitherto the curette has been looked at askance by many obstetricians.

By virtue of its situation the lesion of puerperal sepsis may be compared to a gunshot wound of the perineum or buttocks and the organisms found are apt to be similar. With the exception of the Carrel-Dakin method of treatment, irrigation by antiseptics and hypertonic solutions did not prove of any great value in the treatment of war wounds. During the past two years the author has treated

fifteen patients with puerperal sepsis by the Carrel-Dakin method. One patient, who was moribund when treatment was instituted, died on the day following her admission to the hospital. The author's technique is as follows:

The patient is shaved and a vaginal douche of Dakin's solution is given under a general anæsthetic. The uterus is then curetted with a sharp curette and hæmostasis is obtained to prevent blood clotting in the rubber tubes. From four to six Carrel tubes are then inserted within the cavity of the uterus at various heights and led out to a connecting tube over the pubes. The vagina is packed and a protection of vaseline and gauze is applied over the perineum and vulva. Irrigation is carried out every two hours by the nurse. In a few days the tubes are expelled by the involuting uterus. If they come out before the patient's condition indicates their removal, it may be necessary to replace them.

The author considers the use of the sharp curette necessary and discounts the dangers of opening up fresh channels, air embolism, abscess, and hæmorrhage. In addition he gives from 10 to 15 ccm. of a 1:1000 solution of flavine in normal saline intravenously once or twice daily. The results over the period of a year have been uniformly good. Collargol and bichloride of mercury have not proved to be of particular value.

J. W. Ross.

#### NEW-BORN

**Rodda, F. C.: The Coagulation Time of the Blood in the New-Born, with Especial Reference to Cerebral Hæmorrhage.** *J. Am. M. Ass.*, 1920, lxxv, 452.

The average coagulation time in the normal new-born is seven minutes, with a normal range of from five to nine minutes. The average bleeding time is three and one-half minutes, with a normal range of from two to five minutes.

There is a prolongation of coagulation and bleeding times from the first day to a maximum on the fifth day of life, with a return to the average first-day determination time before the tenth day. It is significant that this coincides with the age of incidence of hæmorrhagic disease and cerebral hæmorrhage.

In the cases studied evidence of hæmorrhage appeared when a prolonged bleeding time was associated with a delayed coagulation time, and delayed coagulation and bleeding times were favorably affected by the subcutaneous administration of whole blood.

Because of their relationship to the problem in hand, data obtained in certain conditions of the new-born are cited as follows:

1. In icterus neonatorum, normal coagulation and bleeding times were found.
2. No cases of sepsis neonatorum were presented for study.
3. Several cases of melena neonatorum gave markedly prolonged coagulation times—up to



ninety minutes—and bleeding times of hours or days. The symptoms were relieved and the reactions returned to normal following repeated injections of blood.

Suspected and mild cases of congenital syphilis gave normal findings, while in severe and progressive cases the coagulation and bleeding times were prolonged. Further, though a temporary reduction in the coagulation and bleeding times could be obtained by the administration of blood, such a reduction was not permanent and one patient died of hæmorrhage in spite of repeated injections of blood given subcutaneously and into the superior longitudinal sinus.

Hæmorrhagic tendencies in the new-born may be latent until an abrasion of the skin, the opening of a hæmatoma, the forcible removal of the cord, or circumcision gives occasion for protracted bleeding. Likewise a rupture in some small vein over the brain surface supplies the impulse for the hæmorrhage if a hæmorrhagic tendency is present. In hæmorrhagic conditions it was found that the bleeding point was often occluded by a soft clot and that the movement of a limb or contact with the bedding often displaced this clot and induced a fresh hæmorrhage. Such a clot in a cerebral vessel might easily be dislodged by crying or vomiting. This explains the protracted step-like progress seen in many cases of cerebral hæmorrhage.

The author's conclusions are as follows:

1. Cerebral hæmorrhage is a frequent occurrence in the new-born, and the most frequent cause of death in the first days of life.

2. Cerebral hæmorrhage is not always due to obstetrical operations; it may follow normal labors when least expected.

3. Severe trauma results in massive hæmorrhages and early death.

4. A more frequent cause of cerebral hæmorrhage is mild trauma plus hæmorrhagic disease of the new-born associated with delayed coagulation time and prolonged bleeding time.

5. A delayed coagulation time and prolonged bleeding time may be controlled by the subcutaneous injection of whole blood. This is a rational therapy for cerebral hæmorrhage.

6. In severe cases surgery should be employed early. The operation should be controlled by blood studies and the injection of blood if indicated.

7. The coagulation time and bleeding time should be determined in every new-born child presenting unusual symptoms, or better, as a matter of routine. If the reactions are delayed, blood should be administered.

EDWARD L. CORNELL.

**Sidbury, J. B.:** The Importance of Lumbar Puncture in Intracranial Hæmorrhage of the New-Born; Report of a Case with Recovery. *Arch. Pediat.*, 1920, xxxvii, 545.

Intracranial hæmorrhage of the new-born is not an uncommon occurrence. In some cases, however, it is very difficult to recognize it or even impossible

to make an absolutely certain diagnosis before death. It may occur in any type of delivery.

The hæmorrhage may be spontaneous and due to a general condition, or the result of trauma.

A prolonged, difficult labor is a most important factor in the etiology of this condition. The early, intelligent application of the forceps will shorten the duration of labor and thereby reduce the length of time the head is under pressure.

The bleeding may occur in any area of the cranial cavity, in the vessels of the dura mater, in the pia mater, in the arachnoid membranes, or in the brain tissue or ventricles. It may be small and punctate or diffuse and cover one or both hemispheres. It may form a clot of varying size and thickness. In some cases it may occupy a third or a fourth of the cranial cavity, in which event it will cause compression of the brain substance and back-pressure of the venous circulation which, in turn, may rupture other capillaries.

How long the blood remains in a fluid state has not been determined definitely but it is known that clotting does not occur so readily as outside of the body. When a lumbar puncture is done in some of these cases as much as 2 oz. of fluid blood which clots readily in the test tube has been obtained.

When, after being well for two or three days, a new-born baby refuses to nurse, becomes pale and listless, and has intermittent crying spells followed by stupor and perhaps convulsions or twitchings of one or more muscle groups, intracranial hæmorrhage should be suspected, especially if the delivery was difficult. Convulsions following an instrumental delivery should suggest this condition.

It must be borne in mind that all of the symptoms of the condition may be entirely absent at birth, and, so far as the mother knows, the baby may have been perfectly well until the eighth or tenth month of age.

Another type of patient with intracranial hæmorrhage comes to the physician at or about the age of puberty because of "peculiar spells." He may have epileptic seizures with or without loss of consciousness, or may be unmanageable.

In every case of suspected intracranial hæmorrhage a lumbar puncture should be done. By relieving the intracranial pressure and stopping the convulsions, this may effect a cure, and in any case will aid in the diagnosis. In a normal infant the intracranial pressure varies from 2 to 5 mm. of mercury, while in the majority of cases of intracranial hæmorrhage it varies from 5 to 25 mm. of mercury.

In the condition under consideration daily lumbar punctures repeated until the spinal fluid is clear of blood are indicated, the pressure being determined each time by means of a spinal mercurial manometer. In this way it can be determined whether the pressure has been reduced to normal and some of the blood is drained off. If focal signs, such as twitching of muscles or eye signs, such as papillitis or engorgement of the retinal veins then persist, a decompression operation should be considered.



Aspiration of the subdural space by puncture through the coronal suture at the lateral angle of the anterior fontanel has been done by Henschen with good results.

The advisability of an operation in these cases is difficult to decide and must be determined from the conditions of the particular case. E. L. CORNELL

#### MISCELLANEOUS

**Torre y Blanco, J.: The X-Ray and Hydatiform Mole** (Rayos X y mola hidatiforme). *Rev. españ. de cirug.*, 1920, ii, 144.

While the etiology and pathology of neoplasms are not yet understood they are assumed to be based on biological reactions. The process by which the placental tissue undergoes degeneration and becomes gradually detached from the uterus and the causes which produce these changes are not well known. According to all of the theories advanced to explain the pathology of hydatiform moles the influence of the ovaries is an important factor. Opinion varies as to the changes in the ovaries. It is possible that cystic degeneration occurs in the corpus luteum, but in the author's opinion this change takes place in the follicle.

To show that the action of the X-ray on the ovaries may give rise to the formation of hydatiform moles a case of metrorrhagia is reported. The patient had had several exposures to the X-ray and was relieved of symptoms for a short time. The sudden onset of metrorrhagia followed, however, with the expulsion of foreign objects simulating grapes. These proved to be hydatiform moles.

Hirsch states that the X-rays produce marked changes in the ovarian tissue and that if a woman whose ovaries have been exposed to the X-rays gives

birth to a child, the child will be abnormal. No mention has been found in the medical literature concerning the X-rays as an etiologic factor in the formation of hydatiform moles. The author finds that they produce marked changes in the graafian follicles but practically no change in the corpus luteum. According to Fraenkel and Néorchaud, it is generally believed that changes in the corpus luteum will stimulate the growth of placental tissue. If this theory is correct, it is not probable that the X-rays have any influence on the formation of hydatiform moles.

No relation between the co-existence of cysts of the corpus luteum and hydatiform moles can be shown. In several instances the cysts of the corpus luteum disappeared after the mole was expelled, and on the other hand hydatiform moles have been found in the presence of a normal corpus luteum.

Blanco reports one case of hydatiform mole with normal corpus luteum and slight changes in the graafian follicles (cystic degeneration and "sclerosis" of the cortical portion of the follicle).

In conclusion the author states:

1. Hydatiform moles originate from placental tissue and their formation is influenced by changes in the ovaries.
2. Changes in the graafian follicles are responsible for the formation of hydatiform moles.
3. Hydatiform moles may cause cysts of the corpus luteum.
4. The action of the X-rays on the ovarian tissue may produce hydatiform moles.
5. The ovaries should not be exposed to large doses of the X-rays.
6. Panhysterectomy without previous curettage is the operation of choice for hydatiform moles.

PIO BLANCO.



## GENITO-URINARY SURGERY

### ADRENAL, KIDNEY, AND URETER

Quinby, W. C.: The Pathology of the Renal Pelvis in Two Cases Showing Hæmaturia of the So-Called Essential Type. *J. Urol.*, 1920, iv, 209.

Two cases are reported — both those of young adults with negative family histories. Both patients complained of hæmaturia. The urine was bacteriologically and microscopically negative except for blood. Cystoscopically the bladders were normal. Separate kidney studies showed the source of bleeding to be unilateral and a nephrectomy was done in each case. The kidneys were normal in size. On section the parenchyma was found to be essentially normal but the mucous membrane of the pelvis and calyces was studded with deep red punctate areas. Minute small red clots were attached to the apices of some of the pyramids and a minute hæmorrhage was found near the apex of the pyramid when it was sectioned. A few pyramids showed deep red lines radiating upward from the apex.

Microscopic sections revealed the hæmorrhages in the peripelvic tissue to be extravasations from thin-walled dilated capillaries and veins. Beneath the pelvic epithelium, which in some places was elevated, unruptured but distended large blood channels could be seen. The hæmorrhages were fresh and there was no blood pigment in the tissues. The blood channels between the collecting tubules of the pyramids near the apex were very wide, irregular and tortuous like sinuses, and distended with blood.

In addition to the hæmorrhages, there was found in one case a distinct inflammatory reaction with evidence of vascular injury as shown by focal accumulations of polymorphonuclear cells and lymphocytes and small foci of necrosis. Careful search did not reveal the presence of bacteria but the inflammatory reaction indicated the presence of an agent causing local injury.

The presence of soluble toxins is suggested. Payne and MacNider ascribe the hæmorrhage to pressure on the veins at the base of the pyramid, but in the two cases reported all of the renal tissue was normal except that near the hæmorrhagic area.

FRANK HINMAN.

Rico, J.: Considerations Regarding False Calculi of the Kidney (Algunas consideraciones acerca de los falsos cálculos del riñón). *Repert. de med. y cirug.*, 1920, xi, 567.

The author points out the frequency with which exploration for stone in the kidney has been done without result. The error is due to the false interpretation of the X-ray findings and a lack of knowledge regarding the factors which may give rise to such mistakes. In the literature the reports of many

cases may be found in which an incorrect interpretation of the X-ray findings led to exploration of the kidney; similar cases occurred in the service of Legueu of Paris. The symptoms referred to the urinary system and the X-ray showed shadows in the region of the kidney. If the urine contained pus, blood, or other elements indicative of inflammation, a tuberculous lesion was found at the time of exploration. In the majority of the case reports no mention is made of urinalysis, but in every instance the kidney function was normal.

Shadows may be produced in the X-ray picture also by other factors either within or outside of the kidney. Error may arise from tuberculosis of the kidney with calcification, calcified exudates from old pyonephrosis, certain tumor-like cysts and malignant growths of the kidney, and traumatic or post-operative renal scars. Outside of the kidney there may be calcified glands along the spine, obliterating emboli, calcified tags of omentum, gall-stones, calculi in, or calcification of, a part of the gland, foreign material such as bone, Murphy buttons, iron, calomel or bismuth in the intestinal tract, calcification of the suprarenal glands, Pott's disease, abscesses, ossification of the costal cartilages, bony overgrowths of the lumbar vertebrae, or osteomyelitis of the floating ribs. Other causes of error are defects in the X-ray plates, such as finger prints and flaws in the glass.

In order to minimize the error of interpretation Rico suggests the use of stereoscopic views. In cases of doubt several X-ray plates should be made at different times. If gall-stones are suspected, two roentgenograms should be made, one each with the patient in the dorsal and the ventral position. If the shadow is larger on the plate exposed with the patient in the ventral position, the symptoms are probably due to gall-stones.

PIO BLANCO.

Lower, W. E.: The Disposition of the Ureter in Surgical Conditions of the Bladder When the Ureteral Orifices Are Involved. *J. Am. M. Ass.*, 1920, lxxv, 711.

The most difficult outstanding problem in genito-urinary surgery is the treatment of malignant tumors of the urinary bladder. The author reviews the functions of the normal ureter and discusses the various methods which have been employed to divert the urine. He regards transplantation of a ureter into another portion of the bladder as difficult in most cases and apt to lead to poor results. His own method of disposing of the ureter when partial excision of the bladder involving one ureteral orifice is necessary has been successful both clinically and experimentally.

When the tumor is situated at the vesical end of the ureter, an elliptical incision is made sufficiently



wide and deep to insure the complete removal of the growth. As a rule this dissection does not necessitate the resection of the ureter for more than from  $\frac{1}{2}$  to  $\frac{3}{4}$  in. After the resection the wound is closed with interrupted sutures of No. 000 chromic catgut. These sutures are adjusted without tension so that they simply arrest hæmorrhage. The ureter is not moved from its normal environment, and the urine which trickles down at regular intervals finds its way into the bladder between the sutures. A mucous membrane soon forms and a ureteral opening is re-established generally somewhat higher than the ureteral opening on the opposite side.

This procedure is not followed by renal colic or ureteral obstruction, and later cystoscopic examination demonstrates that the urine is emitted from the ureters.

While the ureteral opening may be somewhat constricted, the author has never found sufficient constriction to produce a hydronephrosis. If the cut edges are very closely approximated, however, the wound may unite and cause more or less constriction, as happened in one of the experimental cases in which dilation of the ureter and hydronephrosis resulted.

By the method described a tumor may be excised with a sufficiently wide margin to insure its complete removal and the ureter left transplanted, as it were, *in situ*. This is a much simpler method than the transplantation of the ureter to some other part of the bladder. Moreover, it has the advantage that it leaves the ureter with its normal covering, and when the bladder is distended it tends to prevent regurgitation. With the assurance that the flow of urine will not be obstructed, the operator may concentrate his attention more directly on the radical excision of the growth than is possible when the transplantation of the ureter must be considered in addition.

When total extirpation of the bladder is necessary Lower uses the technique described by Coffey some years ago whereby the ureters are transplanted into some portion of the large intestine, preferably the sigmoid or the rectum, as near the bladder as possible. In the class of cases under consideration the operation is performed in several stages, first one ureter being transplanted and then the other after the patency and efficiency of the first is assured. In the final stage the bladder is extirpated.

J. D. BARNEY.

#### BLADDER, URETHRA, AND PENIS

Wesson, M. B.: *Anatomical, Embryological, and Physiological Studies of the Trigone and Neck of the Bladder*. *J. Urol.*, 1920, iv, 279.

A brief review is given of the work done by Bell, Walker, Kolischer, Kohlrusch, and others on the anatomy of the trigone and bladder neck and the methods and sources of material used by the author.

Embryological studies show the origin of the trigone to be mesodermal and that of the fundus

ectodermal. In a 6-mm. foetus the ureteral buds have appeared; in a 13-mm. foetus their cranio-lateral migration has begun; and in a 21-mm. foetus the bladder and urethra begin to separate. At this stage the trigonal muscles develop from the longitudinal muscles of the ureters.

Cystoscopic studies with the patient straining and then relaxing as in voiding show a strong contraction of the trigonal muscle which depresses the floor of the urethral orifice and causes a marked upward movement of the verumontanum.

The trigone is found to contain nerve ganglia and sympathetic fibers while the fundus has both sympathetic and parasympathetic fibers.

The internal sphincter is a double-loop structure rather than a sphincter. The upper arc is made up of fibers of the external longitudinal layer sweeping downward to the vesical orifice. Here they diverge and pass along either side of the urethra at the upper level of which they swing medially and unite in a loop over the urethra without raphé formation. The lower arc is formed by fibers of the internal circular layer.

The external vesical sphincter is made up of striated muscle fibers arising near the lateral wall of the prostate. They encircle the urethra and form a raphé below the loops of the internal sphincter. From this raphé fibers pass downward to form the recto-urethralis muscle.

FRANK HINMAN.

Heineck, A. P.: *Herniæ of the Urinary Bladder*. *Med. Herald*, 1920, xxxix, 229.

In a long and very complete article on hernia of the urinary bladder Heineck discusses all aspects of this condition. His experience is based upon a study of 159 cases. The article is summarized as follows:

1. The urinary bladder, in part or in its entirety, may escape from the abdominal and abdominopelvic cavities through any of the uncommon or common hernial orifices of the lower abdominal wall.
2. Herniæ of the urinary bladder occur in both sexes at all ages and in all races. They are congenital or acquired, recurrent, recent, or of some standing; almost always unilateral, very rarely bilateral. Like other herniæ, they vary in shape, size, rate of growth, and in the discomfort and disability which they entail.
3. In the female, vesical herniæ occur in nulliparæ, primiparæ, and multiparæ; they develop previous to, during, or after gestation and between gestations. They do not interfere with gestation or disturb parturition.
4. According to their anatomical site, vesical herniæ are designated as herniæ of the linea alba, of the obturator, femoral, or inguinal regions. Anatomical relations justify the further subdivision of the latter into interstitial or intraparietal, direct or indirect, complete or incomplete, pudendal or scrotal.
5. The relation of the herniated bladder process to the serous membrane lining the peritoneal cavity is well expressed by the terms intraperitoneal, para-



peritoneal, and extraperitoneal. These designations are serviceable from the viewpoint of etiology, symptomatology, and treatment.

6. According to clinical manifestations, herniæ of the urinary bladder are reducible, irreducible, inflamed, or strangulated.

7. A vesical hernia may be single or double, or one of two or more herniæ located on the same side or opposite sides of the body which have dissimilar contents and present like or unlike anatomical and clinical characteristics. Thus the same patient may present an inguinal cystocele and a femoral epiplocele, a reducible femoral vesical hernia, and an irreducible inguinal intestinal hernia. Case reports of an inguinal vesical hernia on one side co-existing with an inguinal enterocele, epiplocele or enteroepiplocele on the opposite side of the body are not uncommon.

8. As etiological factors in the causation of vesical herniæ, the following are foremost: (1) all conditions tending to increase the intra-abdominal pressure; (2) all conditions, congenital or acquired, which weaken the abdominal wall; (3) all diseases of the lower urinary organs which impair the expulsive force of the bladder or abnormally hinder the outflow of urine; and (4) pre-existing herniæ and hernial sacs of prenatal or postnatal origin.

9. The pre-operative signs and symptoms may be unmistakable, vague, or absolutely wanting. In addition to the symptoms common to all other herniæ, vesical herniæ present peculiar suggestive and positive manifestations of their presence.

10. The herniated bladder process may be the sole content of the hernial swelling or merely one of the associated contents. In addition to a bladder process, a hernial swelling may contain in part or in its entirety, one or more of the following organs: ureter, fallopian tube, ovary, appendix vermiformis, appendix epiploicæ, omentum, the small or large intestine.

11. The herniated bladder process may be free or adherent to surrounding tissues or organs, structurally normal or presenting degenerative, inflammatory, or neoplastic changes. It may be the seat of atrophy, hypertrophy, catarrh, gangrene, tuberculosis, or carcinoma, and may or may not communicate freely with the general vesical cavity. The herniated process of bladder may contain one or more calculi.

12. The vesical hernia may be the sole anomaly, or it may be one of two or more congenital or acquired pathological states, with or without relationship of cause or effect to the hernia (cryptorchism, vaginal cystocele, prolapsus uteri, prostatic hypertrophy, etc.).

13. Truss treatment for herniæ of the bladder is not curative, is often productive of discomfort, and may injuriously affect the structure of the bladder wall.

14. In patients over 3 years of age, all herniæ, irrespective of their anatomical site, clinical condition, or contents, should be subjected to an operation for

radical cure in the absence of a constitutional state contra-indicating operations of election.

15. Clinical conditions so closely simulating herniæ of the urinary bladder that a positive diagnosis without operation appears impossible should be subjected to operative treatment. Benefit can be derived only from adherence to this rule. A diagnosis is established and a cure is effected.

16. All herniæ of the urinary bladder, irrespective of the subject's sex, age, or social condition and irrespective of the size, shape, anatomical site, or clinical type call for operative treatment. Operative treatment is free from danger and curative. The only contra-indications to operative treatment are extreme old age and co-existing operations of necessity. Operative treatment is the only rational treatment of hernia in the adult.

17. In all incarcerated and all strangulated herniæ of the bladder operative intervention is indicated.

18. In all cases of hernia the ideal time for operation is previous to the development of degenerative or other pathologic changes in the herniated organ and organs and previous to the occurrence of any of the various complications incident to hernia.

19. Women who suffer from any form of hernia should be carefully watched before, during, and after their confinement so as to prevent or minimize any undue strain upon the weak regions of the abdominal wall. Such women at the close of lactation or toward the end of the first year following their confinement should be subjected to an operation for the radical cure of the hernia in the absence of contra-indications. In the female the inguinal rings are comparatively small and can be closed without inconvenience to the patient.

20. The most popular and efficient modern hernia operations permit a full view of the operative field and allow such a careful examination of the hernial rings, canals, and surrounding structures that a prolapsed or herniated viscus rarely escapes detection.

21. After the careful opening and isolation of the sac in operations for inguinal and femoral hernia, the latter should consist preferably of peritoneum only and its neck should be freed from all other structures. The neck of the sac should not be twisted as this may draw the bladder toward the hernial opening where it is apt to be included in the ligature. Such inclusion is apt to lead to necrosis and peritonitis.

22. If after the opening of the sac and the reduction of its contents in the course of a hernia operation a second sac appears it is not to be opened unless the introduction of a sound into the bladder shows the complete independence of this sac from the urinary reservoir.

23. In cases of hernia of the urinary bladder first expose and free the herniated organ or organs and then reduce it into the abdominopelvic cavity. Follow this by suppressing the hernial area. Resection of the herniated bladder process is indicated only



exceptionally. When performed, it calls for immediate reconstitution of the urinary reservoir.

24. During hernia operations the wounding of the urinary bladder may be prevented, to a large extent, by operating carefully and by keeping this clinical entity in mind.

25. The prognosis of wounds of the urinary bladder inflicted during the course of hernia operations is good if they are repaired immediately and accurately and if appropriate postoperative treatment is instituted. In the repair of bladder wounds two or three layers of continuous or interrupted absorbable sutures give satisfactory results. Bladder suturing is to be followed by repair of the abdominal wall of the hernial area.

26. If the catheterized urine contains blood within twenty-four to forty-eight hours after a hernia operation on a healthy subject, determine the origin of that blood. If a bladder injury is present, open the hernial operative wound or laparotomize, or do both and repair the injury.

27. The mortality of operations for the radical cure of hernia performed at an opportune time by a rapid and skillful operator competently assisted is practically nil. Coley operated upon 1,000 cases of hernia without a single death.

28. The operative treatment of herniæ of the urinary bladder is highly satisfactory.

J. D. BARNEY.

**Kolischer, G., and Eisenstaedt, J. S.: Papilloma of the Bladder.** *Surg. Clin. Chicago*, 1920, iv, 833.

A man 53 years of age with bladder symptoms for four years complained of fullness in the bladder region and blood in the urine.

Cystoscopy revealed two papillary tumors, one covering the left ureteral orifice and the other in the right upper quadrant. Both had dense pedicles about which were many engorged blood vessels.

Owing to the size of the growths, the inaccessible position of the upper growth, and the circulatory disturbances about the pedicles, it was decided to remove them by the open route and the application of heat directly by means of the galvanocautery.

The bladder was closed without drainage by a double row of sutures, care being used to prevent impaction of the mucosa between the edges of the wound. The adequacy of the suture was tested by filling the bladder with water. Subfascial drainage in the form of a large rubber tube with many fenestræ was employed. The tube extended throughout the course of the incision. Heavy tension sutures were placed through the skin and fascia.

An in-dwelling catheter was not employed. Following the operation described patients either urinate naturally or for a while are catheterized intermittently.

The urine should be kept acid to prevent certain types of infection. In a week following the use of the galvanocautery the slough will be spontaneously removed, leaving a smooth normal surface.

HARRY CULVER.

**Martin, J.: The Treatment of Hypospadias** (Quelques considérations sur le traitement de l'hypospadias). *J. d'urolog. méd. et chir.*, 1920, ix, 249.

After a survey of the various methods employed the author points out the advantages of a combination of the methods of Donnet and Nové-Josserand. Generally the anterior part of the urethra is easily reconstructed, but it is often very difficult to unite the old and new portions of the canal, and the persistence of fistulæ at the juncture necessitates repeated operations. The advantage of the combined method is that the urethra obtained approximates the normal in its structure.

In Nové-Josserand's method the new urethra is made with the aid of dermo-epidermic grafts removed according to the Ollier-Thiersch technique. This method gives only a cicatricial urethra which requires continuous postoperative care to prevent contraction. Its great advantage, however, is that it prevents the formation of a fistula at the point of union of the artificial canal and the normal urethra.

Martin believes that it would be advantageous to replace the dermo-epidermic grafts, which are fragile and retractile, by grafts of whole skin which are only slightly retractile. The necessary material may be obtained from the preputial region which, though only slightly developed on the anterior side in hypospadias, forms a large sac on the dorsal side.

In a case recently treated by the author he utilized a preputial strip and followed Nové-Josserand's method of closing the hypospadias meatus, deviating the urine by a posterior peritoneal urethroplasty. The canal was reconstructed by means of a graft passed through the orifice. The graft used was a whole skin graft. It was made originally with a pedicle, but as this became gangrenous, it was sectioned. The technique is described in detail. In this case a No. 18 bougie could be passed easily three and one-half months after the operation and the new urethra showed little retraction. The time which has passed since the operation, however, is not sufficient to justify a definite conclusion as to the end-results.

In Martin's opinion interior grafts survive better than those used on the outer surface. He states that it is always well to cut the graft with a pedicle, but that even if it is not well vascularized the operation may be successful.

W. A. BRENNAN.

#### GENITAL ORGANS

**Elsendrath, D. N.: The Anatomical Varieties of Prostatic Hypertrophy.** *Surg. Clin. Chicago*, 1920, iv, 663.

To surgeons performing prostatectomies a clear conception of the embryology and anatomy of the normal prostate and of the various pathologic changes which take place in this organ in later life is of great importance. Lowsley states that the portion of the gland which proliferates most frequently are the subcervical glands. The subcervical glands were found to be enlarged in 14.7 per cent of the



prostate glands of 224 subjects varying in age from one month to 79 years.

In hypertrophy of the prostate occurring after middle life the posterior lobe is seldom involved but in many cases appears to be the starting point for malignant degeneration. A specimen removed at operation presented hypertrophy not only of both lateral lobes but of the middle lobe as well. It is in this type that a pouch is formed behind the middle lobe in which the urine is retained after micturition.

In the majority of cases there is an enlargement of the lateral lobes alone or of both the lateral and middle lobes, or chiefly of the middle lobe.

A type of prostate of which little mention is made is known as the "collar type" prostate. In this the entire urethra is surrounded by prostatic tissue. Its importance from the standpoint of urinary obstruction as well as difficulty of removal is not to be underestimated. The chances that a structure will be formed at the vesical neck in such cases is much greater because of the impossibility of securing a line of cleavage between the mucous membrane of the prostatic urethra and the gland proper.

A condition which occurs not infrequently after the removal of the hypertrophied prostate and which may be revealed in a cystogram is that in which the cavity left by the removal of the prostate is not obliterated and is separated from the lumen of the bladder proper by a diaphragm of tissue.

T. F. FINEGAN.

**O'Connor, V. J.: Observations on the Blood Pressure in Cases of Prostatic Obstruction.** *Arch. Surg.*, 1920, 1, 359.

The author reports the results of a study of the blood pressure of 56 cases of urinary retention due to prostatic obstruction. Fifty-five of these cases were operated on. The average age of the patients was 61 years. The oldest was 86 and the youngest 46 years of age.

When the bladder is kept at complete rest by an indwelling catheter or by suprapubic cystotomy, a very appreciable fall in blood pressure occurs during the first twenty-four hours. In this series the average fall in the systolic pressure was 40 mm. of mercury while that in the diastolic pressure was 14 mm. of mercury.

The most marked diminution occurred in patients who presented themselves with a marked hypertension associated with a considerable amount of residual urine (400+ ccm). As a rule the fall seemed to depend almost entirely on two factors, i.e., the quantity of residual urine and the degree of reduction in the renal function. The greatest drop during the first twenty-four hours after constant drainage was 85 mm. in the systolic pressure and 45 mm. in the diastolic.

In no instance did the blood pressure readings show an elevation on the second day as compared with the first day when the bladder was kept at rest.

It was noted that patients operated on at a time when the blood pressure was still decreasing each

day even though there was satisfactory renal function showed a postoperative fall in blood pressure greater than seemed normally commensurate with the degree of operative disturbance. This suggested the possibility that the operations were performed without sufficiently prolonged pre-operative management, despite the fact that the patients' general condition seemed satisfactory and their renal function was entirely adequate. Accordingly no operation was performed thereafter until the blood pressure had maintained a definite level for at least four days.

When drainage was satisfactory 60 per cent of the patients had a subsequent rise in blood pressure after the period of decline. In the systolic pressure the average rise was 16 mm., while in the diastolic pressure it was 5 mm. of mercury.

The conclusions to be drawn from these observations are that, on continued drainage of the bladder, the blood pressure within two weeks maintains a level or equilibrium and at this time the renal function is restored to the greatest extent possible and the patient is in the best general condition for operation.

In the cases of patients who had been prepared for operation until the blood pressure had maintained a definite fixed level the degree of postoperative fall was surprisingly slight.

The relative blood-pressure changes after operation varied considerably. Twenty per cent of the patients had no subsequent rise. The rest had a subsequent rise varying from 10 to 40 mm. of mercury.

The blood-pressure readings of 30 of the patients in this series have been recorded since their discharge from the hospital. The period of observation ranged from one to seventeen months. In 23 patients the blood pressure has continued at practically the same level as that estimated at the time of their discharge from the hospital, while in the rest it is not above the normal limits.

The author's conclusions are summarized as follows:

1. Complete drainage of the bladder in cases of urinary retention is attended by a marked fall in the systolic blood pressure during the first forty-eight hours. During this period the renal function is diminished as shown by the phenolsulphonephthalein test and the quantitative determination of urea in the blood.

2. If satisfactory drainage of the bladder is continued, the blood pressure is gradually maintained at a definite, non-fluctuating level. During this period the adequacy of the renal function and the patient's general condition indicate that he is in the best possible condition for operation.

3. When the operation is delayed until this fixed blood-pressure level has been established a very insignificant postoperative decrease in the blood pressure is noted.

4. As a rule the relief from abnormally high blood pressure still continues in the cases of patients who have suffered from long-standing urinary re-



tention and originally present themselves with a hypertension. The few exceptions are cases of demonstrable cardiac disease.

THEODORE DROZDOWITZ.

**Herbst, R. H., and Thompson, A.: Vasotomy; Indications, Technique, Postoperative Treatment.** *Illinois M. J.*, 1920, xxxviii, 212.

The gonococcus is the most frequent invader of the seminal vesicles and in about 75 per cent of the cases of gonococcal infection of the posterior urethra the seminal vesicles and prostate become involved.

The symptoms of acute inflammation of the vesicles, the prostate, and the posterior urethra are similar, whether one or all of these structures are involved. They consist chiefly of a sensation of fullness and pain in the rectum, frequent and imperative desire to urinate, and a feeling of inability to empty the bladder. Painful nocturnal emissions suggest vesiculitis.

Chronic vesiculitis should be suspected in instances of recurrent or persistent urethral discharge, especially those following intercourse or nocturnal emissions. Digital examination with a study of the expressed fluid clears the diagnosis.

Epididymitis is often caused by partial or complete closure of the ejaculatory ducts which forces the infection to extend down the vas.

Because of the anatomical proximity of the vesicles and the ureters, disturbances often develop in the upper urinary tract due to inflammatory narrowing of the ureter caused by contiguous infection. Hence in cases of obscure symptoms in the upper

urinary tract a careful examination of the vesicles is of importance.

In seminal vesiculitis referred pains are common in the perineum, the inguinal region, the upper border of the sacrum, and the hip from which they sometimes extend into the thigh. This infection frequently acts also as a primary focus from which distinct structures may become involved by metastasis.

Latent seminal vesiculitis may be the cause of infection in the patient's wife.

These severe disturbances may be prevented by preventing posterior urethritis, but when infection has occurred in the acute form local treatment in the form of hot sitz baths, perineal packs, and hot rectal douches with complete rest is indicated. Drainage should be established later by stripping the vesicle. If the disturbances do not respond to this procedure conscientiously carried out, vasotomy should be done. This operation is applicable especially to the more recent cases and to chronic cases in which there has not been too great a change in the wall of the vesicle resulting in perivesiculitis and perhaps walled-off pockets of infection.

The authors emphasize the fact that other urogenital diseases such as stricture, folliculitis and prostatitis may be present and, when practicable, should be cured before vasotomy is attempted.

When the vesicle symptoms are urgent, vasotomy may be done first and the other conditions treated later.

Vasotomy should be done with every epididymotomy in order to prevent the recurrence of complications.

The technique of the operation is well presented graphically.

HARRY CULVER.



## SURGERY OF THE EYE AND EAR

### EYE

**Wiener, M., and Sauer, W. E.: A New Operation for the Relief of Dacryocystitis through the Nasal Route.** *J. Am. M. Ass.*, 1920, lxxv, 868.

The authors review a score of operations, all of which are very similar, and describe their own procedure in detail. The principal difference between their operation and the others is that they pay particular attention to the removal of bone low down on the nasal wall of the sac so that every portion of the sac or duct will drain readily. Following the operation they cauterize the wound in the nose with silver nitrate and pass Bowman probes in order to keep the opening as large as possible until it is healed.

The article contains the reports of six selected cases and a summary of some of the unfavorable as well as the favorable results. T. D. ALLEN.

**Roth, H. H.: The Conservative Treatment of Penetrating Injuries of the Eyeball.** *Internat. J. Surg.*, 1920, xxxiii, 280.

Roth makes the assertion that many eyes have been removed without cause. He states that sympathetic inflammation, though not a common complication, is a source of grave danger, but the fact that in these days an eye can be removed at almost any time by any surgeon is a reason for proceeding slowly.

Too much emphasis cannot be laid upon the importance of X-raying an injured eye if there is any suspicion that the injury was caused by a foreign body. Non-operative treatment consists largely in keeping the patient in bed and instituting aseptic and antiseptic measures. Special mention is made of hexamethylenetetramine.

Roth describes his technique in excising protruding visci and other operative procedures.

T. D. ALLEN.

**Dancy, A. B.: The Removal of Magnetic Foreign Bodies from the Vitreous.** *Internat. J. Surg.*, 1920, xxxiii, 282.

The first removal of a foreign body from the vitreous was done by von Graefe only 65 years ago. Consequently such surgery is of comparative recent date. In Dancy's cases fully 50 per cent of foreign bodies in the eye were magnetic. He states that the absence of objective as well as of subjective signs of injury is thoroughly unreliable in the diagnosis of foreign bodies within the globe.

The use of the giant magnet in the diagnosis is dangerous as by this means the foreign body may be pulled into contact with the ciliary body or lens, in which case a sympathetic ophthalmia or pro-

longed and intractable cyclitis or uveitis may result. If the exact position of the foreign body has been shown by the ophthalmoscope or the roentgen ray, however, the giant or the hand magnet may be used judiciously with great benefit. The foreign body can be drawn forward through the ciliary ring only when it is small and smooth. In practically every case the posterior route is indicated in the operation.

Dancy gives the operative procedure in detail and reports two case histories. T. D. ALLEN.

**Hippel, E.: Further Experience Regarding the Results of Decompression Operations in Cases of Choked Disk** (Weitere Erfahrungen ueber die Ergebnisse der druckentlastenden Operationen bei der Stauungspapille). *Arch. f. Ophth.*, 1920, ci, 362.

The author reviews cases reported by his father and himself previously and adds new material including 26 cases of palliative trephination, 3 cases of ventricle puncture, 8 cases treated by repeated lumbar puncture, and 9 cases in which a radical operation was performed.

Of the patients treated by palliative trephination only 1 died of the operation and this patient was in very poor condition before the operation. Sixteen died within three and one-half years, and 9 within the first nine months of the operation. The rest were benefited as far as vision was concerned.

Of the 14 patients treated by ventricle puncture 2 died three months after the operation; the choice of operation was incorrect as cysts were found. In 7 cases the vision was so greatly impaired before operation that a successful outcome could not be expected. Recovery took place in only 1 case.

In the 5 cases in which ventricle puncture was combined with trephination the results confirmed the impression that the latter is the more effective procedure and that ventricle puncture is indicated especially in the iris stage of choked disk.

The 9 radical operations were performed for tumors of the cerebellar-pontine angle in 3 cases, for a suspected tumor (which was not found at operation) in 1 case, for cysts in 2 cases, for a frontal tumor in 1 case, and for brain abscess in 1 case.

Among the cases treated by lumbar puncture was 1 case of choked disk which cleared up fourteen days after the first puncture. Five patients recovered, 3 of whom had severe injury of the optic nerve. Lumbar puncture is indicated particularly when acute visionary disturbances develop as in such cases, as a rule, meningitis rather than a tumor is present.

Hippel emphasizes the importance of immediate operation even when the vision is normal for usually if the vision is the least impaired it cannot be



restored. A properly performed trephination, if timely, is not associated with great danger and in many cases gives considerable relief. In cases of bulbar lesions recovery may be brought about by operation when otherwise blindness and death would ensue. In cases of acute sudden loss of vision lumbar puncture is necessary. In cerebrospinal lues and choked disk lumbar puncture may be done; decompression operations are indicated only exceptionally.

BRUECKNER (Z).

**Toeroek, E.:** The Results Obtained with Mueller's Resection of the Sclera in Detachment of the Retina Due to High Myopia. *Arch. Ophthalm.*, 1920, xlix, 506.

The author states that practice and experience are necessary before satisfactory results can be obtained with the operation under discussion but that any one who can perform a cyclodialysis without puncturing the choroid will be able to master it after having performed it a few times. It is not such an extensive or dangerous operation as it appears. From the results in 15 cases it is evident that the visual acuity is not increased but is maintained, the detached retina in practically every case remaining re-attached for several years except for small, shallow, stationary detachments.

T. D. ALLEN

#### EAR

**Clay, J. V. F.:** A Clinical Consideration of Acute Mastoiditis with Special Reference to the Indications for Surgical Intervention. *Hahnemann. Monh.*, 1920, lv, 559.

While acute mastoiditis is invariably present in every case of acute otitis media, not every case goes on to abscess formation and bony necrosis. The latter contingency is influenced by: (1) the patient's resistance, (2) the virulence of the infection, (3) the type of the mastoid, and (4) the adequacy and time of treatment of the middle ear infection.

Following a detailed discussion of these four factors the author states that the mastoid should be opened when adequate drainage cannot be obtained through the aditus, tympanic cavity, and ear drum, and when, though drainage may be free, there are symptoms of extension or threatened extension through either of the bony plates.

Insufficiency of drainage is indicated by: (1) mastoid tenderness, particularly if such tenderness is persistent, late, or recurrent after free paracentesis; (2) persistence or an excessive amount of discharge; (3) changes in the drum head; and (4) changes in the canal wall.

While the presence of several or all of these signs points to trouble, the absence of the majority is no proof that there is no necrosis. The X-ray may offer confirmatory evidence but is not to be relied upon exclusively as it is only a link in the chain of evidence. This applies also to elevation of the temperature.

The author sums up the problem as follows:

"We thus see that mastoiditis is a condition presenting varying phases and that every case is a law unto itself; that we are led to open one mastoid because of persistent tenderness in the face of free drainage through the ear; that we send another case to the operating table because the discharge continues profuse in the presence of a free opening in the drum, even though there is no tenderness and especially if the time limit (from four to six weeks) is approaching. Another case is operated upon because the mastoid is tender and the temperature continues high after free drainage has been established from the middle ear. Another case is operated upon because of late or recurrent tenderness. The bacteriological findings in a given case may be a leading factor in determining the necessity for operation. We may operate quickly because the first time we observe the case there are symptoms of threatened or established extension.

"We might multiply various combinations of circumstances leading us to operate and back of all our scientific deductions there is a factor in clinical medicine and surgery which is developed in each of us and which we term 'diagnostic intuition.' 'Good guessing' we used to say of our teachers. It is good or bad as we have developed, but it is one factor in diagnosis that every clinician unconsciously uses very freely."

O. M. ROTT.

**Glogau, O.:** Mastoidectomy (Perisinous Abscess, Exposure of Dura) Followed by Attacks of Toxic Insanity; Recovery. *Laryngoscope*, 1920, xxx, 566.

The author reports a case of mastoidectomy for perisinous abscess which was followed by attacks of toxic insanity and recovery. Because of the fact that this condition simulated temporosphenoidal abscess, Glogau draws attention to the importance of investigating the patient's psychic status before performing any operation, especially on structures near the brain. If such postoperative attacks of insanity then occur, it will be evident that mind rather than matter is at fault. Disregard of the psychic aspect of the problem may lead to the assumption that a temporosphenoidal abscess is the cause of the insanity and may be responsible for unnecessary exploration of the brain.

In explaining this form of insanity the author states that two factors are operative, a combination of somatic and psychic causes. By the toxic influences the repressed wishes and fears based on actual facts in the patient's life immediately preceding the operation are aroused, thrust over the threshold of unconsciousness, and made manifest.

O. M. ROTT.

**Jordan, L. G.:** Report of a Mastoid Series. *Mil. Surgeon*, 1920, xlvii, 310.

This article is a report of a series of mastoid cases operated upon at the U. S. Naval Hospital, N. Y., during the first five months of the current year.



In all, there were 24 patients and 30 operations. The initial 24 operations were simple mastoidectomies. The others were: (1) secondary mastoid operations, 3; (2) operations for perisinous abscess with ulceration of the dura, 1; and (3) operations for sinus thrombosis and excision of the jugular vein which were performed upon the same patient on different days.

The mastoiditis followed an acute purulent otitis media in 15 cases and an acute exacerbation of a chronic purulent otitis media in 8.

The elapsed time from the onset of the acute purulent otitis media until mastoidectomy was performed varied from two to twenty days. In 16 cases the average was eight days.

Pain was present in 20 cases and absent in 4. Tenderness on pressure over the mastoid was positive in most instances. Fever was inconstant, being present only in about 50 per cent of the cases and ranging from 99.5 to 102.5 degrees. Sagging of the posterosuperior wall in the region of the tympanic membrane and discharge were present in every case. The only evidence of mastoiditis in one instance was sagging of the posterosuperior wall and a very profuse discharge.

In the order of frequency the organisms present were: (1) streptococci, (2) pneumococci, (3) mixed bacteria, and (4) staphylococci. Thickening over the mastoid was noted in 2 cases.

Except in the cases of sinus thrombosis and perisinous abscess, the blood count averaged 9,000 with about 72 per cent of polymorphonuclears.

The time elapsing from operation to discharge varied from forty-two to ninety days. Sixteen of the patients recovered normal hearing. In 4 cases,

3 of which were originally cases of chronic suppurative otitis media, the recovery of hearing amounted to 80 per cent. In the case of a man 68 years of age it amounted to 50 per cent, and in another case to 40 per cent at the time of discharge from the hospital.

O. M. RORR.

**Barnhill, J. F.: Anomalous Sigmoid Sinus Thrombosis, with Report of Cases.** *Med. Rec.*, 1920, xcvi, 388.

Barnhill draws attention to the frequent occurrence of cases of infection of the lateral sinus in which most of the typical symptoms and signs are absent. In some cases there may be no fever and in others no ear symptoms. Swelling and tenderness along the course of the jugular vein develop only in the late and fatal cases.

In the author's experience with 37 cases of sinus thrombosis, mastoid tenderness was absent in nearly 50 per cent, and swelling of the neck along the vein was present only in the case of a patient who was generally septic, partially unconscious, and near death. Chills occurred in only 5 cases. Strabismus and other eye symptoms were rare. Only 16 of the author's patients were examined for optic neuritis, but of these, only 2 had choked disc. The presence of an aural discharge is not a necessary symptom.

Four cases are reported in detail. In all of them there was a trivial acute otitis which lasted but a few hours or days and was then forgotten or disregarded and not later connected with the serious illness which was manifested chiefly by a septic temperature and prostration. The diagnosis in these cases was made by excluding every other source of toxic infection.

O. M. RORR.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Bordley, J.:** Optic Nerve Disturbances in Diseases of the Posterior Nasal Sinuses. *J. Am. M. Ass.*, 1920, lxxv, 809.

After discussing the anatomical basis of the various theories relative to the causal relationship between sinus disease and optic nerve disturbances, the author states that in the majority of instances the portion of the nerve originally involved is not the portion in the orbit but the portion held within the confines of the rigid optic canal. According to some authorities the basic cause of the involvement is cedema of the optic nerve canal with resulting venous stasis. Others point to the enlargement of the blind spot as evidence of mechanical pressure and consequent interference with function, while still others believe that the exciting factor is the direct transmission of toxins from the sinuses into and around the vein of Vossius and the capillaries supplying the central bundle.

In the author's opinion none of the theories mentioned is entirely satisfactory. Cases have been seen in which it was evident from the rapidity of recovery that mechanical pressure alone was responsible for the condition; others seem to come clearly within the definition of toxic amblyopia; while in still others it has been demonstrated anatomically that the trouble originated behind the optic foramen.

Following a discussion of the symptoms of optic nerve involvement and a report of several unusual cases the author comments as follows:

"The conclusion of this report leads us to the reason for its presentation. It has been my fortune to see a fair number of optic nerve lesions produced by quite evident sinus disease, and it has also fallen to my lot to meet more than a few which could be determined only by close and repeated observations. There is, I believe, too frequent study of intranasal disease by physicians who judge the probability of ocular complication by the extent of the disease found; there are others who apparently conclude that, without visible evidence in the nose, it is fair to assume that no sinus disease exists. Often neither of these assumptions is correct, and they may lead to very serious consequences. When a general surgeon stands between doubt and certainty as to intra-abdominal disease he generally plays safe by "looking" into the peritoneal cavity. Assuming that the operator is qualified, and assuming also that all other probable causes have been eliminated and that every means of diagnosis has been resorted to I will suggest that when you are face to face with a serious optic nerve disturbance the part of conservatism and good judgment requires an opera-

tive exploration of the ethmoidal and sphenoidal cells. I feel quite confident that visual disturbances are frequently the first suggestions of serious sinus disease which may eventually lead to blindness or to death. It is only fair, then, to heed the warning and eradicate the disease before it has impaired function or destroyed life."

O M ROTT

**White, L. E.:** The Diagnosis of Accessory Sinus Disease Causing Loss of Vision. *Laryngoscope*, 1920, xxx, 551.

Of the 22 patients whose cases are reviewed 3 were not operated upon. The first of these 3 remained permanently blind, the second died from sarcoma, but the third, who was improving when first seen, recovered under local treatment.

In the 19 cases operated upon improvement resulted in all but 2. In one of the 2 exceptions the eye had been practically blind for some months, and in the other, in which the condition had been present for five weeks, there was slight improvement at first, but optic atrophy due to pressure resulted.

Normal vision was obtained in 8 cases. In 4, there was marked improvement, but some atrophy. In 5 cases the improvement was only slight because of the chronic nature of the disease and the delay in operating.

In 3 cases there appeared to be a direct extension of the infection. In 6, the toxæmia from pus seemed the chief of factor. Hyperplasia appeared the predominating lesion in 13 cases. In 7, the nasal examination was negative. In 6, the X-ray findings were positive. Negative findings, however, do not contra-indicate operation.

The middle turbinate was removed in all the cases operated upon and the sphenoid opened in all but one. The posterior ethmoid cell was opened as a matter of routine.

In many cases the changes in the nose are so slight that it is nearly impossible to detect them.

The author does not hesitate to operate on a nose which appears perfectly normal if the symptoms are those of pressure on the nerve and other possible causative factors can be excluded.

Although in some cases recovery may result spontaneously, operation must not be deferred too long as irreparable damage may soon be done. When the condition follows an acute rhinitis, the loss of vision is not complete, and the pressure on the nerve is not so great as to endanger its vitality radical measures may be deferred for a while, but as the period in which an operation can be of benefit is brief care is necessary in differentiating the types which may and may not lead to spontaneous recovery.

O. M. ROTT.



**Lopez, C. J.: Nasopharyngeal Tumors and Their Treatment** (Tumores de la nasofaringe y su tratamiento). *Repert. de med. y cirugía*, 1920, xi, 507.

Lopez divides nasopharyngeal tumors into two classes: (1) the malignant, including epitheliomata and sarcomata, and (2) the benign, including cysts, polyps, papillomata, enchondromata, lipomata, adenomata, and fibromata. The author's study is limited to fibromata of the nasopharynx.

Nasopharyngeal tumors occur very frequently in the male, but are rare in the female. They appear between the ages of 10 and 15 and are generally located in a rectangular area of the pharynx bounded anteriorly by the juncture of the vomer and sphenoid bones, posteriorly by the insertion of the anterior rectus muscle of the eye, and laterally by the pterygoid fossa. They may be found, however, at any point in the nasopharynx where fibrous tissue is present normally. The tumor consists of fibrous tissue with cells in varying degrees of differentiation; the least differentiated cells resemble those of sarcoma and may become malignant or undergo cystic degeneration.

Early symptoms consist of slight difficulty in breathing, mucous nasal discharge, repeated epistaxis, and frontal headaches. Later the patient becomes a mouth breather; the voice is modified by a nasal twang; the nasal secretions are abundant; epistaxis becomes more frequent and profuse; unilateral or bilateral deafness usually develops; taste and smell are affected; and ear-aches and headaches are very severe. In the final stage of the disease the tumor invades the pharynx and the nasal passages, and by pressing on the roof of the mouth eventually grows into the buccal cavity. Invasion of the maxillary sinuses gives rise to epiphora and lachrymation; pressure on the orbit may cause exophthalmos and blindness; and the brain may be invaded through the base of the skull.

Fibromata of the nasopharynx should be differentiated from: (1) adenoid tissue, (2) polyps, which are pedunculated, (3) epitheliomata and sarcomata, and (4) abscess from cervical Pott's disease pointing into the pharynx.

Treatment by electrolysis, which consists in shutting off the circulation of the tumor at its base, is a slow means of cure. Fatal hæmorrhage may follow the removal of the growth by the electric cautery. If pedicled, the tumor may be excised in certain cases by means of a snare, or curettage may be done. Operation should be performed under local or chloroform anæsthesia.

There are two methods of approach to the tumor. To obtain exposure of the maxillary, the sphenoidal and frontal sinuses, and the orbit an incision dividing the upper lip may be made along the side of the nose. Both the roof and the floor of the maxillary sinuses are destroyed. This method may be used when the sinuses have been invaded. A better method is to remove the tumor through the pharynx and nasal fossæ regardless of its size.

PIO BLANCO.

**Sonnenschein, R.: Radium in the Treatment of Malignant Tumors of the Nose and Throat; Its Use and Possible Abuse.** *J. Am. M. Ass.*, 1920, lxxv, 860.

The author reviews the literature regarding the use of radium in the treatment of malignant tumors of the nose and throat and reports a case.

In a brief discussion of the physics of radium it is stated that the radio-active bodies form a series of three, uranium, actinium, and thorium series. In these the atoms are supposed to be unstable, disintegrating finally into stable substances. Radium, the most important member of the uranium series, diminishes one-half in weight over a period of 1,700 years. In its breaking down alpha particles and a gas called niton or radium emanation are formed, the latter in turn emitting beta and gamma rays. The burning action of secondary rays is prevented by covering the tubes and applicators with rubber. Platinum, silver, lead, and aluminum filter out alpha and soft gamma rays.

In the use of radium salts themselves the unit is the weight of the salts, while in the case of the emanation it is the curie or amount of radium emanation in equilibrium with 1 gm. of radium element.

As to dosage, Colwell and Russ state: "Undesirable damage is eliminated by keeping the quantity factor low in the case of the columnar-cell complex and vice versa in the squamous-cell complex."

Radium emanation is applied chiefly in glass or metal tubes which are sometimes needle-shaped to facilitate their insertion into the tissues. The surrounding tissue is protected by a lead screen. The effects of the application of radium are dependent upon the amount used, the duration of the exposure, the distance of the applicator from the tissues, and the character of the filters employed.

The exposure of tumors to beta or gamma rays causes marked inhibition in the growth of the younger cells. To penetrate deeply into the tissues gamma rays are necessary. Prolonged exposure or insufficient filtration may cause sloughing. With proper exposure, fibrous tissue is formed after a slowly subsiding inflammatory reaction and, on contracting, this cuts off the blood supply and causes atrophy.

Radium is recommended both before and after operation. In cases of malignancy of the nose and throat it is used, judging from reports, regardless of whether operation is contemplated or not.

It appears that the destructive action of radium is more marked in tumors of mesodermal origin (sarcomata) than in those of ectodermal origin (carcinomata). The result is less marked especially in the squamous-cell type of carcinoma and hence treatment of new growths of the lingual and buccal mucosa is apt to be disappointing.

As compared with the roentgen ray, radium has the following advantages: it produces a greater reaction with less injury to healthy tissues, it is easily



applied by means of small applicators, it is portable, and it may be used with facility in cavities such as the nose, mouth, and larynx.

Under complications incident to the use of radium are mentioned perforation of the hard palate, acute and chronic dermatitis (the latter may undergo malignant change), telangiectases, and radium toxæmia which occasionally has a fatal outcome.

Of 439 patients with malignancy of the nose and throat whose cases have been reported by various authors 17 per cent were apparently cured and 4 per cent were free from symptoms for one or more years. The condition of 24 per cent was improved, while that of 42 per cent was unimproved. No differentiation was made as to carcinoma or sarcoma. In general, it appears that the sarcomata, especially those of the nasopharynx, reacted favorably, while carcinomata, usually those involving the larynx and tongue, reacted less favorably. In the author's case a sarcoma involving the right tonsil, both faucial pillars, and the soft palate was apparently cured.

While the future of radium therapy is bright, caution in reporting cures is advised. Recurrence should be watched for over periods varying from two to five years. Those who report cases should give the details regarding the preparation used, the method of application, the duration of the exposure, etc. Radium is of great value before, and certainly after, operation, and in inoperable cases relieves pain, hæmorrhage, and discharges. Sarcomata respond especially well, carcinomata less well. The squamous-cell types of epithelioma are scarcely amenable to radium treatment. Radium has many advantages as compared with the roentgen ray, especially in nose and throat work.

The complications are less common than might be expected and consist chiefly of burns. The diagnosis of malignant cases should be made by a competent laryngologist and the treatment administered by him alone or in conjunction with a radiologist. Only in this manner will it be possible to obtain correct statistics and reliable results.

**Chubb, G.: A New Method in Rhinoplasty.** *Lancet*, 1920, cxcix, 354.

Chubb's new method of rhinoplasty was used in the case of a patient with a gunshot injury of the nose. The tip of the nose, the anterior part of the septum, and the whole of the columnella had been destroyed. The nasal bones, however, were intact and the greater part of both alæ was present, lying flat upon the face.

At the first operation a transverse tubed pedicle was made on the left side of the chest immediately below the left breast. Later a piece of cartilage taken from the rib was shaped and placed beneath the skin of the upper end of the pedicle and the other end was attached to the left forearm. Several weeks later, after the collateral circulation had been established through the new attachment, the upper end of the pedicle was attached to the nose.

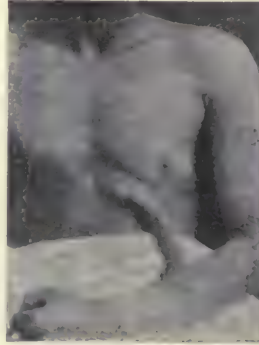


Fig. 1. Transverse tubed pedicle showing upper and lower attachments and cartilage implant in upper end.

Fig. 2. Flap and cartilage implant sutured in place on the nose.

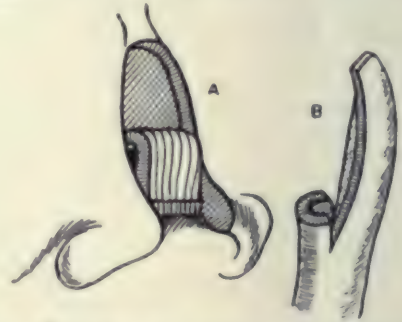


Fig. 3. A. Hinge flap turned down to form a new lining for the nose. B. Cartilage-bearing end of the tubed pedicle showing the two tongues of the flap.

To prepare the nose for the new flap a medial incision was made at the tip, separating the alæ, and a flap formed by a circular incision just above was turned down. The flap was sewed in place to form a new nasal lining and the free cartilage-bearing end of the tubed pedicle, trimmed with two tongues, was placed over the nose. The large tongue was used to cover the raw area left by the flap turned down from above, and the small tongue was sutured to the lower border of the inverted flap and the intra-nasal lining of the cut tips of the alæ.

A columnella was then formed from the outer portion of the upper part of the pedicle. The stitches were left untied until all of the flaps were in position and then were tied and left long.

The author's illustrations show a very good result several months after the operation. The implantation of the cartilage on the chest and its elevation to the face by means of a pedicle borne on the arm has several advantages over methods previously employed. Complete absence of scarring about the face, neck, or breast is assured, absolute symmetry can be maintained, and the skin and cartilage implant may be prepared satisfactorily before there is any interference with the face. F. K. HANSEL.



## THROAT

Yorke, C.: *Anæsthesia in Tonsil and Adenoid Operations*. *Brit. M. J.*, 1920, ii, 318.

In children less than 14 years of age nitrous oxide anæsthesia affords ample time for the enucleation of the tonsils and the removal of adenoids; the performance of the entire operation, which is described by Yorke in detail, occupies not more than twenty minutes. The child is then able to sit up almost immediately, consciousness returns, and hæmorrhage is quickly arrested because of the upright posture. The only untoward occurrence is sudden cessation of breathing when there is overgagging; this can be quickly relieved by easing the gag. In about 6,000 children operated on by Yorke under gas there were no fatalities. Co-operation on the part of the anæsthetist, the nurse, and the doctor is essential.

For operations on adults local anæsthesia induced with 10 per cent cocaine on the pharyngeal wall, the fauces, and the soft palate, and 2 per cent novocaine solution injected into both pillars is advocated. The operative technique is given in detail with illustrations. The advantages claimed for local anæsthesia as compared with general ether anæsthesia are:

1. The patient sits in an upright position in front of the operator.
2. The tongue lies quietly and the reflexes are abolished.
3. The operation may be deliberate and frequently interrupted to allow the expectoration of blood.
4. Hæmorrhage is much less and may be easily controlled by pressure or with a clamp.
5. There is absence of postoperative malaise and prostration.

R. M. NICHOLS.

Rosenblatt, S.: *A Simple Bloodless Tonsillectomy with a Simple, Safe, Local Anæsthesia*. *Laryngoscope*, 1920, xxx, 576.

The method of tonsillectomy described is the method advocated by J. C. Beck of Chicago.

The local anæsthetic used is 1 per cent novocaine with 10 drops of 1:1000 adrenalin added to 15 ccm. of the fresh solution. Instead of the ordinary tonsil syringe with the short dental needles, the author employs a 5- or 10-ccm. Luer glass syringe with a fine-gauge slip-on needle at least  $1\frac{1}{2}$  in. long. Preliminary swabbing of the pharynx is not advocated and the injections are not made into the pillars as is usually the case. Instead, the needle is plunged about 1 in. deep outward, upward, and backward immediately above the point where the two pillars meet so that it reaches an area just external to the highest point of the superior pole or supratonsillar fossa.

The second stab is made about 5 mm. external to the middle of the edge of the anterior pillar, being directed slightly outward so as to bring the point of the needle either within the layers of the capsule or slightly external to them. The two stabs are

then repeated on the other side. About 2.5 ccm. are injected into each area, making 10 ccm. for the four stabs. After the last stab the operation may be begun immediately on the tonsil first injected.

For the tonsillectomy itself three instruments are used: a tongue depressor, a tenaculum, and a Beck snare. In the removal of the right tonsil the snare is held in the right hand and the tongue depressor in the left hand. The fenestrated portion of the snare having been passed beneath the inferior pole of the tonsil and the tonsil lifted up in its bed, the tongue depressor is removed. The snare loop is then almost horizontal, but is tilted very slightly anteriorly and externally, the part of the ring nearest the posterior pillar being highest. The thumb of the left hand is then hooked under and around the shank of the snare loop to afford leverage against the pressure of the index finger of the same hand with which the operator forces the tonsil through the loop by massaging against the anterior pillar. As soon as this pressure between the thumb and index finger has been begun the instrument is tilted more toward the front and slightly externally so that the loop is moved from the horizontal to the vertical position. As soon as the hard ring of the loop is felt through the anterior pillar with the index finger of the left hand the wire loop is pulled up snugly so that it firmly engages the tonsil. The tonsil is then slowly snared off.

O. M. RORT.

## MOUTH

Machat, B. B.: *The Causes, Prevention, and Treatment of Prolonged Pain Following Extraction and Oral Surgical Operations*. *Dental Cosmos*, 1920, lxii, 1043.

The author states that the constant factor causing postoperative pain is pressure. Pre-operative acute, diffuse inflammation of the peridental tissues, a most potent cause of prolonged postoperative pain, should be treated by palliative measures followed by surgical interference as indicated after the tissues have become quiescent.

Machat advocates local anæsthesia, i.e., conduction anæsthesia, whenever possible, induced with novocaine suprarenin solution. The operative field must be kept clean during the operation by packing the back of the mouth and the openings of the salivary ducts, and by drying the field of operation and painting it with aconite and iodine.

Granulomata or cysts should be removed by curettage. The mandibular first molar should be removed in an unbroken arch, the crown being excised first, and the roots then separated and extracted by cutting through the buccal plate. Following this operation the author covers the wound with a light dressing and sutures the flap.

Factors which cause postoperative pain are dressings left in too long, a fractured external plate left unreduced, involution of the gum tissue over the alveolar borders, and a traumatized adjacent tooth or wound. In some cases there may be pain in



edentulous jaws accompanied by sleeplessness and sometimes emaciation dating back to the time of the operation. This operation may have been done months before and an extraction wound may have been kept from healing properly by traumatism from the opposing teeth. The remedy is the use of a plate.

Mention is made of the prolonged anæsthesia mesial to the site of the operation which sometimes follows conduction anæsthesia of the mandible and is due to nerve injury.

When the pain is caused by infection, pus or sloughing, tenderness, glandular involvement, coated tongue, foul breath, etc. are present. In such cases free drainage, stimulating irrigations, ice packs, hot foot baths, purgatives, liquid diet, and rest are indicated.

Whenever the operative data are not clear the parts should be studied with the X-ray and a search made for a remaining root or granuloma.

Pain in dry sockets may be overcome by the formation of a second blood clot.

In conclusion Machat refers to the reaction which may take place after the extraction of numerous teeth at the site of a closed focal infection or of even healthy teeth in a pyorrhœal environment. In such cases there is danger of streptococcæmia as the bacteria of these dental foci are usually streptococci.

LOUIS SCHULTZ.

**New, G. B.: Mixed Tumors of the Throat, Mouth, and Face.** *J. Am. M. Ass.*, 1920, LXXV, 732.

Mixed tumors of the head and neck are found most often in the parotid or submaxillary regions in association with the salivary glands, and on this account are usually called mixed tumors of the salivary glands. They may occur in various parts of the throat, mouth, and face, however, and it would seem that they are in no way related to the salivary glands.

The recent enlargement of a previously existing tumor usually causes the patient to seek an examination. Almost one-half of the 68 tumors in the author's series had been present for more than five years, and the greatest length of time was forty years. Fifty of the growths examined were in the parotid, 5 in the submaxillary region, 13 in the pharynx, 4 in the larynx, 4 in the palate, 2 on the upper lip, 1 in the sublingual region, and 1 in the cheek.

A mixed tumor shows clinically a hard nodular surface with the feel of a malignant growth. In the pharynx it may bulge the soft palate or cause dysphagia and dyspnoea. In the parotid region it is usually freely movable at first but later becomes fixed behind the angle of the jaw where it may cause injury to the facial nerve. The glands are rarely involved previous to operation, and when they are, are not markedly malignant.

The etiology of mixed tumors is obscure; most writers consider them endotheliomata, while some believe that they arise from the salivary glands. In support of the latter theory Frazier states that they arise from the injured ducts of the salivary glands. The fact that they are encapsulated and not connected with the glands seems to disprove the theory. If trauma were a factor these growths would be more common in the submaxillary glands which are more often affected by calculi and inflammation. The theory that they arise from abnormal tissue inclusions during life or the embryonal period seems to be more substantial. Grossly the growths show an encapsulated, rounded, smooth, and lobulated mass. Those which grow slowly are hard, while those which grow rapidly are soft. On section they are granular and may show cystic areas filled with serum. Microscopically they are composed of connective tissue and epithelium in tubular form. The majority also contain cartilage.

The diagnosis must be based on the microscopic examination, but the condition is not difficult to diagnose clinically. The hard, slowly growing tumor which has been present for several years is characteristic. When first noticed it is usually freely movable and  $\frac{1}{2}$  to 1 cm. in diameter. In the palate and pharynx it may simulate a fibroma, and in the parotid, a tuberculous or inflammatory gland.

Surgical treatment is necessary as the growth does not respond to radium. Tumors in the pharynx may be removed through the mouth or the submaxillary and submental regions. A fixed tumor may be removed only in parts, and if it is fixed to the bone, the soldering irons should be used. As a rule it may be removed by making an incision down to the capsule and shelling out the whole mass. In operations on mixed tumors of the parotid the facial nerve may be injured. In recurring tumors of this gland it may be necessary therefore to remove both the parotid and the facial nerve. These tumors are potentially malignant and when they recur after complete primary removal they may metastasize and it may be necessary to perform a block dissection of the neck.

Replies to questionnaires were received from 45 of the 68 patients. There was one recurrence in 34 cases in which a primary operation had been done. Eight of the remaining 11 are free from recurrence. Permanent facial paralysis occurred in 1 case of the group of 34 in which primary operations had been performed.

The type of tumor under discussion should not be classified as a mixed tumor of the salivary glands until there is some evidence to show its relation to these glands. It may be present in the throat, mouth, and face. A favorable prognosis depends on its complete removal at a primary operation as the percentage of recurrence following such removal is very small.

F. K. HANSEL.



# BIBLIOGRAPHY of CURRENT LITERATURE

## GENERAL SURGERY—SURGICAL TECHNIQUE

NOTE.—The bold face figures in brackets at the right of a reference indicate the page of this issue on which an abstract of the article referred to may be found.

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## SURGERY OF THE NOSE, THROAT, AND MOUTH

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# INTERNATIONAL ABSTRACT OF SURGERY

FEBRUARY, 1921

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Kahn, M.:** The Pre-Operative Preparation of Diabetic Patients and Their Subsequent Treatment. *Surg., Gynec. & Obst.*, 1920, xxxi, 363.

Before operating upon patients with diabetes, except in cases of extreme urgency, the degree of acidosis should be determined by Van Slyke's method of estimating the carbon dioxide combining power of the blood plasma or by Fredricia's instrument for measuring the carbon dioxide content of the alveolar air. In diabetes, acidosis is of the ketone substance type due to a disturbance of fat oxidation. The administration of alkalies is not indicated and may hasten an impending coma.

Elimination should be stimulated and the tolerance for carbohydrates should be increased, preferably by the Allen method. Fats and alkaline drugs should be avoided.

In the author's opinion, nitrous oxide is the anæsthetic of choice.

LISTER TUHOLSKE.

**Cohen, L.:** Further Observations in Correct Rhinoplasty. *Surg., Gynec. & Obst.*, 1920, xxxi, 412.

The operation as done by Cohen follows:

1. By means of incisions within the vestibule, one on either side, just below and parallel to the attachment of the upper lateral cartilages to the edges of the pyriform opening, the entire skin of the bony portion of the nose is undermined. The incisions are joined over the dorsum and extended laterally down under the root of the nose.

2. All ridges and irregularities, except the hump proper, are made smooth with a coarse rasp.

3. A saw is introduced first on one side and then on the other, and the nasal bones are severed at their attachment to the nasal processes of the superior maxillæ and from the bony septum. A considerable portion of the upper edges of both nasal processes is removed with a coarse rasp.

4. A V-shaped section of the entire thickness of the septum is removed. This includes the lower

edge of the triangular cartilage and part of the subseptum directly below. The base of this section is placed beneath the dorsum just above the tip, and the apex at the anterior nasal spine. Similar but smaller V-shaped sections, the bases of which meet at the midline of the nose, are removed from the upper lateral cartilages, one on each side.

5. Puncture incisions are made through the cartilages and the lining membrane from within, parallel to the septum, one on each side. The width of the nose including the tip is reduced by removing a strip of cartilage with its lining by means of the forceps. Adhesive dressing is used to hold the wound edges together.

6. The vestibule is packed lightly with iodoform tape, and adhesive strips are applied to compress the tip and support the entire cartilaginous nose. Sutures are not employed. After four or five days another dressing is substituted which is utilized for about four weeks and is renewed every four or five days. Over these adhesive dressings the usual saddle splint is applied.

I. W. BACH.

**Van Paing, J. F.:** The Knife Cautery in Surgery of the Thorax. *N. York M. J.*, 1920, cxii, 673.

The author describes his technique with the knife-cautery in lung surgery and states that it decreases hæmorrhage, shock, and postoperative morbidity.

He concludes his article with the following recommendations:

1. Accurate diagnosis based upon the physical signs, the history, and the X-ray examination.

2. Avoidance of delay in operating.

3. As rapid an operation as is consistent with careful technique.

4. The use of the knife cautery at red heat to the exclusion of all other methods when the lung tissue is to be incised.

5. Avoidance of sutures whenever and wherever possible.

6. The use of rubber tissue in cases requiring drainage.



7. Strict postoperative attention, the application of a pneumonia jacket, and nutritious diet.

8. Morphine to the point of narcosis the first twenty-four to seventy-two hours.

9. Blood transfusion early and repeated if necessary in shock, hæmorrhage, delirium, and anæmia.

10. Breathing exercises and fresh air in delayed re-expansion.

K. L. VEHE.

**Passot, R.: Modern and New Methods of Æsthetic Suture** (*Procédés modernes et nouveaux de suture esthétique*). *Presse m'd.*, Par., 1920, xxviii, 693.

There are several factors which influence the appearance of a scar. One is the surgeon's technique and another the patient's general condition. An incision should be made in such a manner that tension will be perpendicular to its principal axis. Therefore the surgeon should know the direction of the principal axis of the skin in the various parts of the body where an æsthetic scar is desired.

The author discusses various æsthetic incisions, those which will be completely hidden by the hair, those only partly visible, and those which will always be exposed.

The intradermal suture was first described by Chassaignac in 1851. This suture the author considers inconvenient because of its weakness and the difficulty of applying it in the regions of the face and neck where the skin is thin and where in spite of great care, it yields under the pressure of the needle. Passot has obtained better results with a specially designed semicircular needle than with the needles usually employed for this purpose, and with a new method he has devised in which strengthening sutures are unnecessary.

After approximating the edges of the wound by intradermal suture he covers the wound with a strip of adhesive celophane fixed with collodion, places strips of adhesive over this dressing, and then fixes these strips by placing two others across their extremities. He then removes about 2 cm. from the center of each strip over the incision and sutures the ends of opposite strips together. Traction is thus supported by the strips of adhesive instead of the wound. The author calls this "a method of suturing over the dressing." Great care should be taken to make the strips adhere firmly.

W. A. BRENNAN.

**Pauchet, V.: Postoperative Fistulæ of the Colon** (*Fistules coliques post-opératoires*). *Gynéc. et obst.*, 1920, ii, 30.

Intestinal fistulæ may result from the accidental opening of the large intestine during a gynecological operation and from the formation of an abscess about a ligature. As a rule such fistulæ close spontaneously after a few weeks, but in some cases they persist and necessitate operative treatment.

Large suppurating fæcal fistulæ must be treated by the formation of a temporary transverse artificial anus, and if this does not effect a cure, by direct operation on the fistula itself.

Fistulæ without pus may be attacked directly. These are of three types:

1. Simple fistulæ. Before an incision is made the course of the fistula is traced by an injection of methylene blue. The intestinal loops are then exposed and the perforation is sutured.

2. Fistulæ difficult to expose because they are hidden by adherent intestinal loops. A fistula of this type may be traced by inserting a probe before the incision is made. The treatment consists in suturing together the edges of two buttonhole incisions in the loops of bowel in contact with the fistula. By this procedure the fistula is buried between the two opened loops.

3. Fistulæ of large size. A transverse anus should be formed to the left of the umbilicus and the intestine completely sectioned. Pauchet has found that placing the lower portion of the colon at rest in this manner often results in a cure. Every eight days the patient was given an enema to discover whether any of the water would pass through the fistula. When it ceased to pass through, the fistula was closed.

The transverse anus has the advantage that if a subsequent operation is necessary the opening into the intestine will be far from the umbilicopubic incision. If the artificial anus does not cause the fistula to close, an operation may be performed after two or three months when the danger will be less on account of the disinfection of the lower end of the colon. The transverse anus may be closed when water injected through the normal anus emerges from the cutaneous end of the lower segment of the colon without passing through the fistula.

W. A. BRENNAN.

## ANÆSTHESIA

**Rick, F.: Experiences with Paravertebral and Parasacral Anæsthesia** (*Erfahrungen mit der Paravertebral- und Parasakral-Anæsthesie*). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1920, liii, 357.

This is a report of 100 operations, 12 of which were performed under parasacral anæsthesia, 10 under paravertebral anæsthesia, and 78 under anæsthesia induced by both methods. The decision as to which of these methods or whether both should be employed depends, of course, on the operation which is to be performed. For operative procedures on the vagina and perineum parasacral anæsthesia alone is sufficient, while for other gynecological operations the anæsthesia must be carried upward as far as the sixth dorsal spine.

In regard to the technique the author refers to Siegel's method with the remark that it is rather difficult and may result in injuries such as perforation of the kidney or rectum. In the cases reported the solution injected was the usual  $\frac{1}{2}$  per cent novocaine-adrenalin solution. About 90 injections of 5 c. cm. were given for extensive operations, and between thirty-five and forty minutes were consumed in the induction of the anæsthesia. As a



rule the anæsthesia obtained was complete and persisted for seven hours.

A previously induced twilight sleep is absolutely necessary for success. This was obtained with veronal, scopolamin, and narcophin, the dosage being regulated according to the patient's body weight, age, general condition, and psychic state. The average duration of the twilight sleep was five and one-half hours. Occasionally even this combined method was not successful and inhalation anæsthesia was necessary in addition. As a rule, however, it was sufficient for the most extensive gynecological operations and without ill effect.

KNOKE (Z).

**Brody, H.: The Advantage of the Use of Local Anæsthesia for the Performance of Oral Surgical Operations upon Patients with Pulmonary Tuberculosis.** *Dental Cosmos*, 1920, lxii, 1227.

The author sums up the advantages of local anæsthesia over general anæsthesia in oral surgery on patients with pulmonary tuberculosis as follows:

1. The dangers following the administration of general anæsthetics are absent.
2. The after-effects subsequent to general anæsthesia, such as pneumonia, renal disorders, vomiting, and nausea, are prevented.
3. The necessity for an anæsthetist and cumbersome appliances is obviated.
4. Local hæmostasis can be procured by adding suprarenin to the novocaine solution and therefore the field of operation is almost bloodless.
5. The patient is able to co-operate with the surgeon.
6. The patient is able to expectorate and therefore mucus and blood are not swallowed.

7. As the parts remain anæsthetized for an hour, the operator is able to work with deliberation.

8. Lengthy preparation for the operation is unnecessary.

9. The patient may be discharged after the operation.

10. The nerve endings are paralyzed so that impressions caused by the traumatism are not transmitted to the brain, being prevented from traveling beyond the point of the injection as in the conduction method. When the patient is under the influence of a general anæsthetic the sensory paths are not blocked and there is a needless exhaustion of nerve force; surgical shock is the result.

Brody discusses also the advantages of anoci-association over general anæsthesia, warning against depriving a patient with pulmonary tuberculosis, even temporarily, of the usual amount of oxygen. Such deprivation occurs in the administration of a general anæsthetic even though nitrous oxide and oxygen are used. The administration of a mild narcotic, such as bromural, veronal, or codein sulphate, before the operation is recommended. Novocaine, in the author's opinion, is an ideal local anæsthetic.

The conclusions drawn are as follows:

1. General anæsthetics are contra-indicated for the performance of oral surgical operations upon patients with pleuropulmonary affections.
2. The excitation during the induction of general anæsthesia is equal to that of the entire period in which a local anæsthetic is used.
3. Anoci-association is best secured by pre-operative medication, local anæsthesia, and special management.

LOUIS SCHULTZ.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Dandy, W. E.: The Diagnosis and Treatment of Hydrocephalus Resulting from Strictures of the Aqueduct of Sylvius.** *Surg., Gynec. & Obst.*, 1920, xxxi, 340.

Dandy reports a series of cases of hydrocephalus due to stenosis of the aqueduct of Sylvius. As a rule this condition begins in the prenatal period and develops rapidly both during prenatal and post-natal life, though its manifestations may not be clearly evident for some time after birth.

In 1919 the author and Blackfan reported a series of 18 cases of hydrocephalus, and in 1917 a series of 25 cases, in which complete studies on the absorption of cerebrospinal fluid were made during life. Tests were devised to differentiate the types of hydrocephalus and obtain an index of the functions of the ventricles and the cerebrospinal spaces. The subdivision of most cases of hydrocephalus into two main classes, communicating and obstructive, still holds good.

Hydrocephalus is always a secondary condition. While in some cases the primary lesion may be discovered easily, as a rule this is very difficult. Nearly all cases of hydrocephalus are due to an obstruction, but in the so-called "obstructive group" the obstruction is situated in some part of the ventricular system.

In the so-called "communicating group" the ventricles are in communication with the subarachnoid space and the obstruction, which usually consists of adhesions, lies in the latter. The differentiation into these two great groups is clinically possible and may be accomplished easily with the use of a colored dye test. If after the dye has been injected into a lateral ventricle it quickly appears in the spinal fluid (lumbar puncture), there is a communication between the ventricles and the subarachnoid space, and the hydrocephalus is that known as the "communicating" type. The absence of the dye in the spinal fluid denotes an obstruction at some point in the ventricular system and that the hydrocephalus is of the "obstructive" type.



Dandy has collected from the literature all the reported cases of hydrocephalus due to stricture of the aqueduct of Sylvius. A study of these cases and of those he observed personally showed that in each instance only epithelial remnants of the lining ependyma remain and the defect is replaced by hypertrophy of the glial tissue. In one of Dandy's cases not a trace of epithelium could be found in any of the sections.

In the gross, the region of the occluded iter differs but little from the surrounding mesencephalic tissue. There is usually no increased density noticeable to the touch and the mesencephalon appears to be normal except as regards the aqueduct. In every case in which the aqueduct of Sylvius was occluded, the third and both lateral ventricles were dilated, the degree varying with the time which had lapsed after the stricture had formed. The size of the fourth ventricle was not increased except when the foramina of Luschka and Magendie were occluded also. The dilation of the third and both lateral ventricles is due to the fact that the closure of the aqueduct of Sylvius removes the only avenue by which the cerebrospinal fluid may escape from these ventricles.

By the newer methods it is now possible to determine the presence of hydrocephalus in the earlier stages of its development. It is no longer necessary to await progressive enlargement of the head with great destruction of brain tissue.

The presence of a meningocele should always be looked upon as a suspicious sign that hydrocephalus may be an associated and far more serious condition.

The aqueduct of Sylvius is the weakest and at the same time the most important link in the ventricular system. Its lumen should normally be open for the passage of the cerebrospinal fluid which is constantly but very slowly poured through it. Hypertrophy of glia cannot be regarded as a tumor because it has not the cellular element of a tumor; moreover, it does not proliferate beyond the immediate region of the iter. Glia behaves essentially as does connective tissue. Its growth must be secondary and not primary. It would be difficult to imagine a primary rampant growth of connective tissue beyond the confines of a normal epithelial lining. It would appear more probable that there had been primary destruction of the epithelial lining of the aqueduct and that the attempt of nature to heal the breach with glial tissue had resulted in the stenosis of the iter at the affected zone. The closure of only a portion of the aqueduct in many cases supports the view that an epithelial defect is primary, for it is not probable that a primary connective-tissue growth would be so restricted. It is believed also that intra-uterine inflammations play a considerable part in producing stenosis of the aqueduct.

As to the clinical manifestations, the author states that the only constant feature in these cases is a large head of varying size. It is quite remarkable

how a limited amount of intelligence may continue to develop in young children in spite of the rapid progressive destruction of the brain. Even with a head measuring 60 to 70 cm. in circumference, the child may learn to speak distinctly though, of course, with a greatly restricted vocabulary. Many hydrocephalic children have a downward displacement of the eyes due to depression of the roof of the orbit. Because of this displacement, the sclera shows above the iris and the iris is partially covered below. Quite frequently also there is considerable limitation of the various extra-ocular movements. Convulsions are common, though the majority of patients are not so afflicted. Blindness is a not infrequent complication.

The diagnosis of hydrocephalus can now be made with absolute certainty and the degree of the ventricular dilatation determined with absolute accuracy by ventriculography. When moderately advanced, the condition may often be recognized by an X-ray examination without ventriculography.

When the diagnosis of hydrocephalus has been made, it may be determined whether the ventricles communicate with the subarachnoid space by a simple procedure. One cubic centimeter of indigo-carmin is injected into a lateral ventricle and thirty minutes later a lumbar puncture is done. If the ventricles communicate with the subarachnoid space, the dye will have appeared in quantity in the spinal fluid at this time. In such cases the hydrocephalus is of the communicating type. If the dye does not appear in the spinal fluid in this period of time, it is evident that an obstruction is present in some part of the ventricular system.

The precise location of the site of the obstruction may be determined only by ventriculography. If the obstruction is at the aqueduct of Sylvius, the shadow of the third, and particularly of the lateral, ventricles will be greatly dilated, but no air will be present in the fourth ventricle. If air is present in the fourth ventricle, the obstruction is not at the aqueduct of Sylvius.

The difficulties encountered in treating lesions of the aqueduct of Sylvius would appear almost insuperable, but by the increasing number of cases in which the aqueduct has been exposed during the extirpation of cerebellar tumors, the author has been encouraged in the belief that possibly a direct attack may be made upon the mesencephalon even in infants. At least twenty-five times during the past year he has seen the cerebrospinal fluid pour through the aqueduct into the fourth ventricle.

In order to treat the cause directly, Dandy proposes a method of reconstructing the obliterated aqueduct of Sylvius. He has performed this operation twice, on children 1 year and 5 years of age. The older child died of pneumonia seven weeks after the operation, but the younger child was still living at the time the paper was written. The steps of the procedure are as follows:

After a bilateral exposure of the cerebellum, the vermis is elevated with a small spatula, and the



normal foramen of Magendie and fourth ventricle are exposed. Into this a fine catheter is gently passed forward until it meets the obstruction at the aqueduct of Sylvius. To obtain a satisfactory exposure it is necessary to divide the lower half of the vermis in the midline and carry the incision through the roof of the fourth ventricle. A nasal dilator introduced into this defect gives good exposure of the funnel-like anterior terminus of the fourth ventricle and the entrance to the aqueduct of Sylvius. A small sound entering the orifice meets the obstruction and is carefully forced through it into the third ventricle. Fluid at once escapes freely through the opening which again establishes communication between the third and fourth ventricles. Larger sounds are then passed to increase the size of the lumen. A small rubber catheter is pushed into the newly made channel and left in position for a period of two or three weeks after the operation. This tube has numerous perforations to prevent closure of its lumen by fibrin but that portion of it which lies in the aqueduct is smooth and without perforations. The anterior part of the tube projects into the third ventricle, while the posterior part is in the fourth ventricle and lies on the pons and medulla. The tube is anchored with a silk ligature to the dura at the foramen-magnum. At this point its end is cut off and the lumen closed by a ligature. The excess tubing which traverses the entire length of the fourth ventricle is necessary to prevent the dislocation or loss of the tube. The nuchal muscles are carefully closed over the wound, giving good protection over the large foreign body which is quite deeply buried.

As a result of his study the author has reached the following conclusions:

1. Cicatricial stenosis of the aqueduct of Sylvius is the most frequent lesion in congenital hydrocephalus (about 50 per cent), and is found in a large percentage of cases of hydrocephalus occurring in infancy and early childhood. It may occur also (though rarely) in adult life.

2. Hydrocephalus always follows occlusion of the aqueduct. The third and both lateral ventricles progressively dilate. The fourth ventricle, being posterior to the obstruction, does not enlarge.

3. In the gross, the occluded aqueduct appears to be replaced by a fibrous tissue which microscopically is neuroglia. Microscopic remnants of the aqueduct are found usually but not invariably.

4. The stenosis may occupy the entire length of the aqueduct or varying parts of it and may be only a thin transparent membrane. In some cases the stricture may be partial.

5. Strictures of the aqueduct of Sylvius may be diagnosed and accurately localized. The indigo-carmin test will show the presence of an obstruction, and its location may be determined by ventriculography.

6. Spontaneous relief is not possible. All surgical attempts to drain the fluid from the third ventricle to the exterior of the brain have proved futile. The

openings invariably close and the fluid is not absorbed in the subdural space.

7. The cause of the condition may be overcome by the construction of a new aqueduct of Sylvius, a tube being left in place for two or three weeks. It is possible that the epithelium will regenerate and establish a new canal.

G. W. HOCHREIN.

**Masland, H. C.: Cutting the Bone Flap in Cranial Surgery.** *Ann. Surg.*, 1920, lxxii, 511.

The method of cutting bone flaps in cranial surgery presented by the author follows the usual basic lines of procedure, but the instruments used differ from those ordinarily employed and are believed to give better end-results.

The bone cutting is done quickly and with safety to the soft tissues and under perfect control. There is a minimum wastage of bone so that in replacement the bone edges are closely apposed and good mechanical protection is provided.

The instruments for opening the skull comprise a quarter inch Roberts trephine and a modified circular saw devised by the author.

The Roberts trephine, like the Hudson drill, jams when it has passed through the inner table of the skull and therefore the possibility of injuring the dura or brain is nil if it is carefully used. The circular saw has both an outside and an inside guard. The outside guard is fixed to restrict the cutting to the external table. This table having been cut, the external guard is removed, the internal guard is inserted through the trephine opening, and the cut in the inner table is made, the dura being separated from the skull by means of the guard as the cutting progresses.

H. A. MCKNIGHT.

**Ransohoff, J. L.: The Surgical Treatment of Fractures of the Skull.** *Internat. J. Surg.*, 1920, xxxiii, 307.

Hospital records show that fractures of the skull are equal to 2 per cent of all fractures.

The gravity of the injury depends entirely on the amount of damage to the brain. Every scalp wound which is the result of direct violence should be considered a potential skull fracture until proved otherwise. A case emphasizing this point is cited.

When a diagnosis of extradural hæmorrhage is made, operation is necessary. The pulse and blood pressure are reliable indications of the patient's condition. Nature's effort at compensation produces two reflex phenomena: bradycardia and increased blood pressure. When the pulse becomes rapid and the blood pressure falls, operation is useless.

Operation is necessary in cases of compound depressed fracture of the skull but unnecessary in cases of fissure fracture without symptoms. As patients with skull fractures do not stand a general anæsthetic well, the author operates under local anæsthesia induced with 1 per cent novocaine.

When there is an accumulation of blood beneath the dura, the dura should be incised and the accumulation washed away. When the brain substance



is crushed, the devitalized tissue must be washed out by a stream of warm normal saline solution under pressure. Wounds should be closed without drainage.

Patients with fracture of the base of the skull as a rule are poor operative risks. In basal fracture with no localizing symptoms and with signs of increasing pressure repeated spinal puncture may be done. If this does not give the desired effect, a subtemporal decompression is necessary. The patient must not be moved for at least three weeks after operative interference. I. E. BISHKOW.

**Bailey, P:** Cruveilhier's "Tumeurs Perlées." *Surg., Gynec. & Obst.*, 1920, xxxi, 390.

Bailey reports two cases of Cruveilhier's "tumeurs perlées," both of which were operated on by Dr. Harvey Cushing.

The growths discussed in this article are of the same nature as those described by Bostroem as "haarlosen pialen Epidermoide." This latter term is based on a theory as to their origin, regarding which there has been considerable confusion.

True pearly tumors are rarely seen in man but are well known to veterinarians because of their frequent occurrence in the lateral ventricle of the horse. Tooth found but one such growth in man in a series of 258 cases of brain tumor verified at autopsy or operation, and Bernhardt found only one in a series of 487 autopsies on brain tumor cases.

The most frequent location of these tumors is beneath the pons and midbrain extending up into the cerebellopontine angle, but they may occur in any area of the base of the brain from the anterior perforated space to the foramen magnum. Occasionally they are formed in the lateral ventricle, a fact of interest since this is their most frequent location in the horse.

It must be borne in mind that pearly tumors are growths and not brain tumors proper. Even those arising from the plexus of the lateral ventricle undoubtedly originate in the pial tissue of the interior of the plexus tufts. They lie always beneath the arachnoid in the pia, a fact which Bostroem stresses in his term "haarlosen pialen Epidermoide."

Grossly the tumors resemble mother-of-pearl, both in tint and luster. The surface, which is smooth and silky, has irregular pea-sized or larger elevations and peels away easily. The surface layers are tough, with about the malleability of heavy tin foil. With a knife blade, flakes which show the characteristic luster beautifully may easily be separated from the surface.

The growths are usually solid but may have an irregular cavity in the center. The interior is composed of a white, dry, crumbly mass which is very easily crushed. There is always an entire absence of blood vessels.

Meyer summarized the histologic structure thus: "Histologically the cholesteatomata are composed of a fine fibrous wall formed of the pia whose inner surface is covered by layers of flat, polygonal cells

containing keratohyalin granules, further masses of cells which have fallen off the walls, and a fatty mass mixed with cholesterol crystals. That is the microscopic structure of a pure cholesteatoma."

The flat outer cells consist of a homogeneous material giving a typical horn reaction with Gram's stain and have no nuclei. It has been claimed that the intercellular material may be successfully impregnated with silver.

Beneath these flat horny cells are polygonal cells with fairly well preserved nuclei. In their cytoplasm numerous keratohyalin granules may be found. It is said also that eleidin granules are found occasionally.

Many theories have been advanced to explain the origin of pearly tumors. Cruveilhier considered the cholesterol to be a secretory product laid down in the subarachnoid space. Thurnam seems to have been the first to call attention to the resemblance to dead epithelial cells. The most peculiar hypothesis is probably that of Auvray, who considered them to be angiosarcomata which had undergone fatty degeneration. The structure is so definitely epithelial, however, that since definite proof of an endothelial origin is lacking, an epithelial origin may be assumed.

The pearly tumors of the fourth ventricle are slowly growing benign lesions which have been of more interest to the pathologist than the surgeon. They have been found often accidentally at autopsy, their presence not having been suspected during life.

Those situated in the fourth ventricle are the most amenable to surgical interference as they may be reached easily through a bilateral suboccipital exposure.

One of the cases reported by the author was that of a woman 28 years of age who exhibited atypical cerebellar symptoms. At operation a pearly tumor of the fourth ventricle was found and removed. Good recovery followed. The second case was that of a boy, aged 13, who complained of failing vision. The lesion was found to be a pearly tumor of the third ventricle.

Histologic examination proved conclusively that both these growths were true pearly tumors. The outer part of the tumor was divided into very definite layers. From without inward the author has termed these the "stratum durum," "stratum granulosum," "stratum fibrosum," and "stratum cellulosum."

The question as to the origin of pearly tumors is not answered by these two cases. The histologic picture suggests epithelium. The presence of the stratum fibrosum free from nuclei or other cellular structure between the stratum granulosum and the stratum cellulosum is difficult to explain. It seems possible, however, that the stratum durum originated from cornification of the cells of the stratum granulosum. It may be that the stratum fibrosum contained cells similar to those of the stratum cellulosum which were flattened out after they were dead and in which the cell structure was destroyed. The stratum granulosum, the cells of which were already



undergoing cornification, was resistant and retained its cellular structure to a certain degree. The entire mass was certainly quite dead. Apparently it had choked itself out after growing to a certain size and then remained dormant for years until an obstruction to the drainage of cerebrospinal fluid arose, when it gave rise to acute symptoms.

G. W. HOCHREIN.

**Blair, V. P.: Some Observations on Our War Experiences with Face and Jaw Injuries.** *Mil. Surgeon*, 1920, xlvii, 379.

Early treatment is of great importance as regards recovery. A patient with an oral or pharyngeal wound should be placed in a sitting position, or, if he must lie down, should be turned on his face, a  $\frac{1}{2}$  rubber tube having been placed through the mouth into the oral pharynx to give free airway.

Sepsis plays a large part in delaying recovery. The greatest preventive of sepsis is early restoration of the tissues remaining after the injury to their normal position. Fragments should be splinted early in their proper position and drainage established.

As the tissues of the face are almost immune to ordinary infections, it is unnecessary to practice débridement except for the removal of tissue devitalized early.

The floor of the mouth and the submaxillary and submental regions are peculiarly susceptible to an indurating infection, and if one of the primary branches of the carotid has been injured, the closer the wound approaches the carotid region, the greater the danger. Therefore, except to anchor the tongue, no repair is attempted in this region. Above the lower border of the mandible, however, all soft tissues should be repaired if the condition of the tissue permits. This applies especially to the alæ of the nose, the angle of the mouth, the ear, the eyelid, and the lip, as these areas retract rapidly and later repair is always more difficult.

Removal of foreign bodies in the primary operation is also desirable. Local anæsthesia adds to the safety of surgical intervention in these cases, but if the anæsthetic is given by the mask or the intratracheal method carefully, the danger will be slight. No patient should be returned to the ward until free breathing space is assured, hæmorrhage controlled, and adequate drainage provided. Secondary hæmorrhage is always the result of sepsis. Therefore treatment should be given for sepsis as well as for hæmorrhage. Sepsis about face wounds is best controlled by drainage, frequently changed packs or external dressings, and cleansing mouth washes. The Carrel-Dakin type of treatment or the use of other germicides is not well tolerated here. Ordinarily incisions should not be made until pus is demonstrable, but indurating infections of the floor of the mouth and submaxillary regions which are spreading or embarrass respiration demand free incision. All incisions for sepsis about the floor of the mouth should be made from the skin surface.

While loss of segments of bone and delay in union are of course due to the original injury, the determining factor is usually sepsis and as a rule is induced by the presence of a foreign body such as a fragment of dead bone or the exposed root of a devitalized tooth. The offending body should be removed.

The length of time bone grafting should be delayed depends largely upon the degree of sepsis. Grafted bone must be subjected to the strain of function or it will become absorbed. An essential part of almost every plastic operation is the complete removal of all scar tissue to reduce the distortion of neighboring parts and facilitate restoration.

I. W. BACH.

**Cole, P.: The Surgical Treatment of Malignant Disease of the Lip and Jaw.** *Lancet*, 1920, cxcix, 845.

Cole lays particular stress on the eradication of malignant disease of the lip and jaw, the restoration of function, and the prevention of deformity.

In a consideration of malignant disease of the lip he quotes Broders of the Mayo Clinic who compiled statistical data on a series of 537 cases. Broders divides epithelioma of the lip into four grades according to the differentiation of the cells. The least malignant type is that in which differentiation is most pronounced. Lack of differentiation indicates the rapid growth of more pronounced malignancy. In this series, 526 of the patients were males and 11 females. The youngest was 21 years and the oldest 97 years. The average age was 57 years. In a number of cases the growth was preceded by a sore or ulcer. Syphilis and tobacco play a negligible part in the etiology. The average duration of the condition was two and one-half years, the longest twenty-eight years. Broders found that in 449 patients subjected to gland operation, 334 (76.6 per cent) were free from metastases. Metastases were found in the remaining 105 patients. Only 12 of these are living. The author believes that the V-excision should not be employed as the number of local recurrences has been high following this method.

In military plastic surgery facial defects may be repaired only after considerable scar tissue and deformity have resulted. Operation is thus made more difficult on account of the loss of elasticity of the tissues. Moreover, the resulting facial expression is not so good as that which can be obtained by a primary operation following an injury or the removal of a growth.

In every case of malignant disease of the lip the submental, submaxillary, and upper carotid glands should be excised on both sides to prevent glandular involvement.

The epulis is the most common tumor of the jaw and may be a pure fibroma or a myeloid sarcoma. The former arises from the alveolodental periosteum and the latter from the alveolus itself. The fibrous epulis is a small, firm, pedunculated, sessile tumor



generally situated in the incisor region. The myeloid epulis is usually larger and softer, and bleeds easily. The tumor, the adjoining teeth, and the alveolus should be removed.

The epithelial odontoma is one of the many odontomata which affect the jaws. It is more rare than the dentigerous cyst or follicular odontoma. These tumors expand the jaw slowly and, when the walls become thin, give rise to the physical sign of egg-shell crackling. The follicular odontoma contains within the wall a well-formed tooth or denticle; the dental cyst contains only fluid and an epithelial lining. The latter is probably associated in its formation with the remnants of the enamel organ.

With the exception of the endosteal sarcoma of the round or spindle-cell type, sarcoma is rare before the age of 15. The endosteal sarcoma expands and later breaks through the bone, while the periosteal sarcoma surrounds it. The latter is the more malignant.

Squamous-cell carcinoma of the antrum, which probably arises from the enamel organ islets embedded in the alveolodental periosteum, usually occurs in the fifth and sixth decades. The symptoms usually begin with a trifling pain for which the neighboring teeth are extracted. Later the growth may protrude from the unhealed socket.

In removing tumors from the mandible steps should be taken to minimize deformity and maintain function. Removal of half of the mandible will permit muscular action to pull the sound half downward, inward, and backward. Therefore to control distortion a dental appliance should be employed at the time of operation. The mobile half of the mandible should be splinted to the maxilla in such a way that their relative positions are correctly maintained. Between six and eight weeks later this should be replaced by a permanent appliance which will allow mastication.

In Cole's method of repairing the lip the angle of the mouth is formed by rotation of the mucous membrane rather than by the juncture of the mucous membrane to the skin along the linear slit.

F. K. HANSEL.

**Lain, E. S.: A Clinical Study of Epithelioma of the Lower Lip.** *J. Am. M. Ass.*, 1920, lxxv, 1052.

For purposes of prognosis and routine treatment Lain has found it convenient to classify epitheliomata of the lower lip in three groups:

**CLASS 1.** Epitheliomata which may begin as seborrhœic-like crusts, small recurrent vesicles or fissures, at first superficial, later becoming infiltrated and indurated, etc., and situated entirely or almost entirely on the cutaneous surface of the lower lip.

**CLASS 2.** Those which are so located that one-third or more of the lesion overlaps the mucocutaneous border of the lip, though no glandular enlargement is noted on palpation.

**CLASS 3.** All cases in which more than half of the malignant growth is situated on the mucous

surface of the lip and the condition has been present for many weeks or months, and cases in which, because of neglect or incomplete treatment, a marked recurrence has developed.

Of the author's series of 122 consecutive cases of epithelioma of the lower lip, 117 were those of men and 5 those of women. The patients varied in age from 23 to 86 years and the majority were farmers and outdoor laborers. Treatment with the roentgen ray or radium, alone or combined, was given in 107 cases. Of 72 patients belonging to Class 1, 95.8 per cent are living today or survived for more than three years. Of 27 patients belonging in Class 2, 70.3 per cent survived from one to nine years. In Class 3, 19 patients were examined and 4 of these were treated. Three of the latter died within one year.

The author closes his article with the following conclusions:

1. Considering the gravity of epithelioma of the lower lip and its frequency in adult males, American physicians have not given the subject the study and attention it deserves.

2. Epithelioma of the lower lip is far more common in outdoor workers, and occurs most frequently on the side of the mouth where a cigar or pipe is held.

3. Early diagnosis and treatment of the lymph drainage of the lips will materially increase the percentage of cures.

4. Neither surgery, radiotherapy, nor any other one method of treatment is applicable to all cases alike.

5. Radium and the roentgen ray, used alone or in combination, give the most satisfactory results in a selected type of epithelioma of the lower lip.

E. C. ROBITSHEK.

## NECK

**Cottis, G. W.: Practical Points in Goiter Surgery.** *N. York State J. M.*, 1920, xx, 290.

The term "goiter" is used to designate enlargements of the thyroid which probably vary decidedly in their etiology. The author classifies goiters as toxic, non-toxic, and malignant and draws attention to the distinction made by Plummer between exophthalmic goiter and toxic adenomata.

Surgery is not indicated in the non-toxic goiters of adolescence and pregnancy as they usually yield to medical treatment. As a rule the adenomata do not respond to medical treatment and operation is indicated for the relief of pressure symptoms or for its cosmetic effect. Patients with toxic goiters should not be operated on during the height of a crisis, but should be treated medically until the crisis is safely passed. There are cases which closely simulate hyperthyroidism, but do not respond to operation on the thyroid.

The author recommends local anæsthesia for all ligations and for resection in very toxic cases. Adrenalin should not be used in the novocaine solution as in some cases it may be the cause of a reaction fol-



lowing the local anæsthesia. This reaction is similar to that in the Goetsch test for exophthalmic goiter.

Adenomata should be enucleated if possible, but when they are multiple, care should be taken to find the portion of the gland which is least diseased in order that it may be left. The posterior portions of both lobes should be left *in situ* in any operation performed under general anæsthesia in order that injury to the recurrent laryngeal nerve may be avoided.

The author recommends routine ligation of one superior thyroid artery in all cases of exophthalmic goiter as a test of the patient's ability to withstand operation.

Postoperative hyperthyroidism is a difficult condition to treat and is best prevented by selecting the cases for operation, the anæsthetic, and the type of operation carefully and by preventing trauma.

G. S. FOULDS.

**Goetsch, E.: Studies on Disorders of the Thyroid Gland. II. Further Experiences with the Epinephrin Hypersensitiveness Test, with Especial Reference to "Diffuse Adenomatosis" of the Thyroid Gland.** *Endocrinology*, 1920, iv, 389.

In disorders of the thyroid gland there is a group of borderline cases which are very difficult to diagnose and more difficult to treat satisfactorily. As a rule the patient is a young adult who presents a syndrome suggestive of hyperthyroidism, incipient tuberculosis, neurocirculatory asthenia, and allied conditions. Positive eye signs and clinical findings in the thyroid gland are absent and the condition does not respond to ordinary medical and hygienic measures. The reaction to the epinephrin test is positive, but in many cases the basal metabolism is not found to be increased.

In this type of case extensive resection of the thyroid gland is followed by striking improvement and microscopic examination of the thyroid shows a characteristic picture hitherto unrecognized as responsible for a definite type of hyperthyroidism. The change in the gland consists of a definite increase in the interstitial so-called "adenomatous tissue" together with an increase in the amount of lymphoid tissue and an associated hypoplasia of the primary alveolar or acinar epithelium. This interstitial tissue is not aggregated into nodules, but scattered diffusely through the gland. The increase in interstitial tissue doubtless arises from the interstitial cells. It produces a picture to which Goetsch has given the name "diffuse adenomatosis" and may produce moderate states of hyperthyroidism.

That this change in the gland is responsible for hyperthyroidism is shown by the following facts:

1. There is an associated syndrome more or less characteristic of the hyperthyroid state.
2. The condition does not improve under ordinary hygienic and medical measures.
3. The reaction to the epinephrin chloride test is positive.

4. After resection of the thyroid there is a diminution or disappearance of this hypersensitiveness with considerable improvement, if not cure.

5. Characteristic changes are found in the gland.

SAMUEL KAHN

**Judd, E. S.: The Results of the Surgical Treatment of Exophthalmic Goiter.** *N. York State J. M.*, 1920, xx, 287.

In estimating the results of the surgical treatment of hyperthyroidism it is important to have a definite understanding regarding the different types of toxic goiters. Surgery is based on anatomy and pathology and errors arise if an attempt is made to establish operative procedure on any other foundation. The histologic picture of exophthalmic goiter shows hypertrophy and hyperplasia of the thyroid gland and the symptoms subside following the removal of a part of the gland. If the symptoms return the same cellular change has taken place in the unremoved portion.

The technique of thyroidectomy is more difficult in exophthalmic goiter than in other lesions of the thyroid gland because of its more friable character due to the increase in cellular structure and the presence of numerous small blood vessels.

The improvement in operative results in recent years is due to a better clinical understanding of the disease and refinement in operative technique. Plummer pointed out several years ago that hyperthyroidism occurs in cycles, the onset being gradual and the symptoms increasing until a climax is reached when there is a gradual subsidence to nearly normal or normal. One or more repetitions of the symptoms may occur after a variable length of time. Beneficial treatment means the reduction of the natural mortality, a briefer course, and the prevention of permanent organic degeneration.

The time of instituting surgical treatment is a most important factor. The most opportune time is late in the decline of the symptoms. Most patients will recover eventually if they are carried over the climax by rest, increased elimination, hot water or quinine-urea injections, or one or more ligations. Ligation is of more benefit than any other palliative measure, but should not be resorted to in the more severe cases until the more simple procedures have been tried.

It is best to advise thyroidectomy as soon as recovery is sufficient to make the operation safe as the patient will be much better after the gland is removed and the danger of relapse is reduced.

The determination of the basal metabolic rate, which is always increased in these cases, is a valuable addition to the clinical picture and physical findings in the determination of the degree of toxicity.

In the treatment, radium and the X-ray have been used by others and good results have been reported. Means and Auld claim that, according to metabolic studies, the same results may be obtained by radiological treatment as by surgery and the mortality is nil.



The increase in hyperthyroidism which usually follows operation is the chief cause of death. Among 100 consecutive patients with hyperthyroidism operated on in 1914 there were 2 deaths. Ninety per cent of these patients returned for examination or were traced by letter. Sixty-one per cent are free from signs and symptoms at least six years after the operation, 13.5 per cent are markedly improved, and 55 per cent are slightly improved. Eleven of the patients died after leaving the Clinic; most of them were much better or apparently cured of hyper-

thyroidism when discharged. None of this series required a secondary thyroidectomy, although 15 of 387 operations for exophthalmic goiter in 1914 were secondary operations for recurrence of symptoms.

Improvement in the technique as to the location of the incision and the method of closing the tissues has reduced the objections to operation on the basis of the cosmetic result. Lobectomy should be reserved for the very severe cases in which it appears that thyroidectomy in one stage would be too extreme.

MERLE R. HOON.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Bull, P.: Extrapleural Thoracoplasty in the Treatment of Pulmonary Tuberculosis, with an Account of 37 Cases.** *Lancet*, 1920, cxcix, 778.

The author presents a report on his experience with the operation of extrapleural thoracoplasty on 37 patients with pulmonary tuberculosis operated on from one to six years previously. Twelve of these patients were males and 25 females. The operation seeks to secure collapse and loss of function of the lung through resection of ribs. The extent of the resection varies with that of the disease and its intrapulmonary situation. It is not necessary to aim at a complete de-ossification of the thoracic wall and obliteration of one-half of the thoracic cavity. A restriction of its lumen so that the sunken wall closes about the sunken lung is sufficient. This is achieved by resecting about 12 cm. of the tenth and ninth ribs and 15 cm. of the remaining ribs up to the fourth. When there is pronounced disease in the upper lobe the second and first ribs also should be resected.

The position of the scapula against the chest wall renders immobilization imperfect or incomplete unless the resection is carried up through the fourth, third, and second ribs. The scapula is thus allowed to fall forward toward the thoracic cavity. The first rib was removed in 8 of 15 cases regarded as cured and the second rib was removed in 6. Resection included the third rib in only 1 case.

Anæsthesia is secured by regional infiltration of each intercostal nerve with 1 per cent novocaine solution.

The incision is begun at the spine of the scapula midway between the margin of the scapula and the spinous processes, continued parallel with the spinous processes to the tenth rib, and then bent outward along the tenth or eleventh rib to the scapular line. When the arm is drawn outward or upward and the musculature is cut, it is possible, with broad retractors, to gain access to the region under the scapula and resect as large pieces of rib as desired. The musculature is sewed with catgut, the skin with silk. Resection of the first two ribs is greatly facilitated by apicolysis or loosening of the apex of the lung.

The author operated on his first 11 patients in one stage, but since then has employed a two-stage operation. In the first stage resection from the eleventh to the sixth or fifth rib is performed, and in the second stage the remaining ribs, including the first, are resected.

Apical cavities are the most difficult to cure. When the effect of thoracoplasty is insufficient, the author resorts to Tuffier's intrathoracic fat transplantation:

A longitudinal incision of 10 to 15 cm. is made in the axilla and from 6 to 8 cm. of the fourth and third ribs are resected. Apicolysis is done by cutting through the periosteum and endothoracic fascia, thus reaching the layer between the parietal pleura and the endothoracic fascia. By blunt dissection a cavity the size of a hen's egg or a medium-sized potato is formed, extending up to the first rib. A pad of fat with attached superficial fascia from the abdomen is deposited within the cavity. The wound is then completely closed in three layers with drainage. Tuffier's investigations have shown that in aseptically healed cases the transplanted fat is converted into firm fibro-adipose tissue. In the author's 9 cases of intrathoracic fat transplantation healing has been effected in 5. He does not believe, however, that this gives a correct impression of the success of the method.

The effect of extrapleural thoracotomy may be compared to the effect of treatment by pneumothorax, as both collapse the diseased lung. The author, therefore, recommends his method only in cases of unilateral pulmonary tuberculosis when artificial pneumothorax has been attempted without result or is not feasible on account of extensive pleural adhesions. An advanced destructive process with the formation of cavities suggests the necessity for earlier interference than tuberculosis which assumes a fibrous form with shrinkage and runs a chronic course.

Contra-indications to operation are tuberculosis of the lower lobe or advanced disease of the other lung and tuberculosis in such parts of the body as the kidneys, intestines, bones, joints, etc. A slight laryngeal tuberculosis does not defer operation as the lesion is improved with the decrease of cough and sputum.



In the author's first series of 11 cases, 3 patients (27.3 per cent) died immediately after the operation. In the second series of 26 cases only 1 patient died. The mortality from the immediate operation was therefore reduced to 4 per cent and the total mortality in the 37 cases was about 10 per cent. A curative result was obtained in 40 per cent of the total number of cases operated on and in 45 per cent of those in which the patient survived the operation.

A. C. JOHNSON.

**Eggers, C.: The Relative Value of Various Operative Procedures Employed in Acute Empyema.** *J. Am. M. Ass.*, 1920, lxxv, 995.

Cases of empyema should be studied with regard to: (1) the antecedent disease; (2) the type of organism concerned and its virulence; (3) the prevailing climatic conditions; (4) whether the cases are sporadic or epidemic; (5) the treatment; and (6) the mortality rate.

The most common of avoidable causes of chronic empyema is inadequate drainage. The retention of pus leads to repeated re-infection of the cavity and the development of a thick, unyielding pleura. Another cause is too-early operation.

The treatment must be adapted to the requirements of the particular case as no one method will always give uniformly good results. In a common type of empyema which follows pneumococcus pneumonia the pus collects in the lower part of the chest. An intercostal incision in the eighth or ninth space or resection of a portion of the eighth or ninth rib will place the drainage at the most dependent part of the cavity. The after-treatment should consist of simple open drainage alone or combined with irrigation, preferably with Dakin's solution.

If an unusually large amount of fluid is present, one of the two following courses may be followed:

1. Aspiration of the fluid repeated, until the pneumonia subsides and as often as the thorax re-fills followed by the formation of a simple drainage opening. As a curative measure aspiration is of little value.

2. A closed method of drainage. This may be used in the more urgent cases.

Occasionally the bottle system of drainage with negative pressure is of advantage. Suction should not be employed while the inflammation in the lung is active. Healing depends, not on suction, but on sterility and the latter is best obtained by open drainage.

Eggers believes that the only safe method of closing an empyema cavity is its obliteration. When pus is present it must be given free exit.

C. R. STEINKE.

**Shulian, O. F.: Trocar Thoracotomy Versus Rib Resection in Acute Empyema.** *Illinois M. J.*, 1920, xxxviii, 339.

The method with which the writer has had the most experience is a modification of that advocated by Diederich. Briefly the routine is as follows:

1. A definite idea as to the extent and character of the pyothorax is obtained by means of stereoscopic X-ray pictures.

2. Trocar thoracotomy is performed under anaesthesia induced with 5 per cent procaine solution preferably near the anterior axillary line in order that the heavy muscles of the back may be avoided and the discomfort and pain caused by the tube and dressings minimized. A small skin incision is made at least 1 in. below the intercostal space to be punctured, and the specially devised trocar of Diederich or Phillips passed external to, and upward over, the edge of the rib, avoiding the intercostal vessels, then through the intercostal muscles and parietal pleura into the pleural cavity. A Dakin tube clamped at the outer end and carried in the extra arm of the cannula is then forced into the pleural cavity and the trocar is withdrawn. The tube is secured to the skin by means of adhesive tape, a small pad of sterile gauze being interposed between the latter and the skin wound.

3. The pleural cavity is aspirated and irrigated with normal saline solution. If cough does not ensue, Dakin's solution is used and this treatment repeated six to eight times in twenty-four hours. About 30 c. cm. of fluid are allowed to remain in the cavity after the irrigating fluid returns clear. Both Diederich and Moschowitz advocate using saline solution first because of the occasional presence of a pulmonary fistula connecting the pleural cavity with a bronchiole. Obviously this contra-indicates irrigation with any solution. During irrigation care must be taken to prevent the sucking in of air through the tube or its injection through the irrigating syringe. Irrigation under moderate pressure when the cavity is completely filled removes shreds of necrotic membrane and has a tendency to prevent the walling-off of small pockets before the entire cavity is sterilized.

4. The routine use of blow bottles is encouraged as it favors lung expansion but is not as essential in cases treated by the Phillips suction apparatus as in others.

5. If negative smears and cultures are obtained on two successive days after the use of Dakin's solution has been discontinued for eight hours, 30 c. cm. of a twenty-four-hour-old 2 per cent solution of formaldehyde in glycerine are injected into the cavity as is done by Mazingo at Walter Reed Hospital. The Dakin tube is then withdrawn and the thoracotomy wound allowed to close. Formerly the sinus was partly or completely excised and a few stitches were introduced, but since the adoption of the practice of incising the skin and superficial fascia at a point below the interspace to be punctured by the trocar this has not been found necessary, the wound closing very promptly because of the retraction of the superficial structures to their normal place.

Eighteen patients treated in the manner described spent an average of sixteen days in the hospital and suffered comparatively little pain. In these



cases the average dressing cost was \$4.50 while the corresponding cost in rib resection cases treated at the same institutions varied between \$35 and \$60. The method described does not result in deformity or a gaping discharging wound. The cavity reopened after sterilization in only 2 of the cases so treated. One of these responded immediately to the use of Beck's bismuth paste. In the other, two injections have been given to date and there is now a fair prospect of early closure.

In the author's judgment Phillips' technique supplementing trocar thoracotomy with suction by means of his ingenious apparatus which maintains a constant negative pressure of from 30 to 60 mm. of mercury should be adopted. If followed by irrigation and concluded after sterilization is accomplished by the injection of formalized glycerine it constitutes the ideal method of combating empyema. The importance of roentgenoscopic and roentgenographic examination before and after thoracotomy cannot be too forcibly emphasized for pyothorax may be found in many cases in which one or more diagnostic punctures fail to reveal it.

Shulian's conclusions are as follows:

Trocar thoracotomy with the establishment of negative pressure, irrigation with Dakin's solution, and sterilization of the cavity with formalized glycerine should be the accepted method of treating acute pyothorax because: (1) it may be performed without shock and pulmonary collapse; (2) general anaesthesia is unnecessary; (3) the possibility of secondary infection is reduced to a minimum; (4) accidents, complications, and sequelae such as hæmorrhage, rib necrosis, chronic sinuses, etc., while possible, are not probable; (5) expansion of the collapsed lung is greatly facilitated instead of retarded; (6) the method is associated with less pain and discomfort; (7) the size and number of dressings necessary is greatly reduced; (8) the period of invalidism is decreased at least one-third; (9) there is no deformity and the scar is almost imperceptible; (10) the method is applicable to cases of bilateral pyothorax; and (11) it prevents pneumothorax and facilitates the egress of pus. E. C. ROBITSHEK.

**Plenk, A.: Splitting the Sternum for Substernal Goiter** (Zur Sternenspaltung bei substernaler Struma). *Deutsche Ztschr. f. Chir.*, 1920, clvi, 378.

Substernal goiters may be classified as retrosternal, retroclavicular, and endothoracic. The syndrome caused by them is variable. There is both a tracheal and a mediastinal syndrome in which, in addition to dyspnoea, there are circulatory disturbances due to compression of the large blood vessels of the mediastinum. The retrosternal goiters lie either entirely or partially behind the notch formed by the anterior wall of the thoracic aperture. We therefore frequently see in such goiters a compression furrow and the depth of this furrow is an indication of the amount of pressure caused by the growth.

The usual method of delivering retrosternal goiters by luxation is a formidable procedure as the vessels

of the goiter may be torn and the forcing of the growth through the opening causes dyspnoea and suffocation. If the goiter has become adherent to the large vessels the delivery may be dangerous as large vessels may be torn and the trachea, already deformed, cannot stand much further compression. To simplify access to such a goiter and to enlarge the thoracic aperture the author advises splitting the sternum. Jehn was the first to report an operation of this kind.

At the Hohenegg clinic a median incision is made in the manubrium and from this two slanting incisions are extended into the first intercostal space against the upper edge of the second rib. The incisions in the bone are made best with a Gussenbauer saw or gouge nippers. The ordinary chisel, with which the division could be effected most easily, is not practical as the operation is carried out under local anaesthesia. By splitting the sternum a diastasis of about 6 cm. is obtained and the entire upper mediastinum is well exposed.

The author reports five cases operated on in the manner described. In all, the operation was performed under local anaesthesia without the use of positive-pressure apparatus and in none was there lasting damage to the shoulder girdle, thrombosis, or infection.

VON TAPPEINER (Z).

## PHARYNX AND OESOPHAGUS

**Ashby, H. T.: Oesophageal Obstruction in Young Children.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Dis. Child., 146.

The author has had five cases of obstruction of the lower end of the oesophagus, one of which he reports in detail with postmortem findings. The condition, which is analogous to hypertrophic stenosis of the pylorus, is at first spasmodic; later there is fibrosis. No history of swallowing caustics is given. The stricture is always about 1 in. above the cardia. In the case reported it was 1 in. in length and permitted the passage of only a small probe.

The symptoms are noted at ten or twelve months following the ingestion of solids. The X-ray with bismuth establishes the diagnosis.

For well-marked cases the author advocates gastrostomy to give the stricture complete rest. At times dilatation is done with bougies under an anaesthetic which relaxes the spasm. K. L. VEHE.

**Hartmann, H.: Diverticula of the Oesophagus** (Les diverticules de l'oesophage). *J. de chir.*, 1920, xvi, 481.

Hartmann believes that oesophageal diverticula are not rare but are often mistaken for stenosis or spasm. The error is still frequent although an X-ray examination should make the diagnosis clear. Two clinical types are recognized: traction diverticula and pulsion diverticula. Those of the traction type were found in 4 per cent of a large number of autopsies on adults but usually are of no interest to the surgeon. As a rule they occur in the lower part



of the œsophagus, have an oblique ascending direction, and do not arrest the food that is swallowed.

The surgical diverticula are those of the upper part of the œsophagus. Radioscopy is the simplest and best method in the examination as the lateral and anteroposterior views give an exact picture of the pocket and show its relation to the rest of the œsophagus.

When untreated, pulsion diverticula terminate fatally after a number of years following progressive malnutrition, pulmonary complications, peri-œsophageal phlegmons, or secondary cancer. Surgery is often delayed, however, because the condition develops slowly and operation exposes the patient to the risk of infection of the deep tissues of the neck and propagation of the inflammation to the mediastinum.

Extirpation of the sac in a one-stage operation followed by immediate suture of the pharyngo-œsophageal breach is the operation performed most frequently.

To the 53 cases collected in 1910 by Stetten the author adds 2 others, 1 of which is a case of his own. In the latter the pocket was extirpated a month after the formation of a gastric fistula. Alimentation by mouth was begun two weeks after the operation and the gastric fistula was closed two weeks later. Complete recovery resulted. Radioscopy now shows the œsophageal passage to be normal and the patient has no difficulty in swallowing.

While the author does not condemn other methods of operating, he believes that invagination of the sac into the œsophagus after it has been puckered with a purse-string suture is practical only when the diverticulum is small. If the sac is large, extirpation in one or two stages is necessary. As an anæsthetic for this procedure chloroform is better than ether as the latter causes a copious secretion of mucus. The sac should always be emptied before the operation.

W. A. BRENNAN.

### MISCELLANEOUS

**Meyer, W.:** The Principles Underlying the Safe and More Rapid Evolution of Thoracic Surgery. *Am. J. M. Sc.*, 1920, clx, 504.

The two principles underlying the safe and more rapid evolution of thoracic surgery are:

1. The use of the differential pressure method to prevent the occurrence of an acute pneumothorax during operation.

2. The immediate and complete closure of the incision and air-tight thoracic drainage after every operation on the thorax to prevent acute postoperative pneumothorax and the accumulation of fluid in the pleural sac.

E. C. ROBITSHEK.

**Graham, E. A.:** The Importance of the Vital Capacity in Thoracic Surgery. *J. Am. M. Ass.*, 1920, lxxv, 992.

"Vital capacity" is the amount of air given out in the greatest possible expiration after the greatest

possible inspiration. The average in normal men between 5 ft., 8½ in. and 6 ft. in height is 4,800 c.cm., and in normal women over 5 ft., 6 in. in height, 3,275 c. cm. If the vital capacity is so low that it practically equals the tidal air, any further interference with respiration will almost surely result in death from asphyxia.

The degree of asphyxia which will follow the creation of an open pneumothorax in a normal chest depends to a considerable extent on the ratio of the amount of air which enters the thoracic opening to the amount which enters the lungs at each inspiration. It is possible to show this relationship by means of the following mathematical expression, in which, as will be seen, the vital capacity is an important factor:

$$V - \frac{R_1}{R_2} T$$

$$X = \frac{\frac{R_1}{R_2} T}{\frac{R_1}{R_2} T} aC$$

*V*, vital capacity.

*R*<sub>1</sub>, rate of respiration before the opening is made.

*R*<sub>2</sub>, rate of respiration after the opening is made.

*T*, tidal air (approximately 500 c.cm.).

*a*, a factor less than 1 (assumed to be 0.8).

*C*, area of the glottis (about 2.25 sq.cm.).

If in substituting numerical values in the equation 4,800 is inserted for *V* (the normal vital capacity of men between 5 ft., 8½ in. and 6 ft. in height, according to Peabody and Wentworth), 15 for *R*<sub>1</sub> (an average rate of respiration during complete rest), and 60 for *R*<sub>2</sub> (an estimated maximum rate for the greatest possible depth of respiration), then

$$X = \frac{4,800 - 125}{125} aC = 37.4 \times 1.8, \text{ or}$$

$$X = 67.32 \text{ sq. cm., or } 10.4 \text{ sq. in.}$$

In other words a normal man between 5 ft., 8½ in. and 6 ft. in height should be able to withstand a thoracic opening of about 67 sq. cm. or 10 sq. in. for as long a time as his respiratory muscles are able to maintain a maximum effort.

In acute pneumonia, air hunger and extreme cyanosis persist in spite of a maximal respiratory effort, and the vital capacity must be nearly as low as the tidal air requirement.

Three case reports are given. The author summarizes his conclusions as follows:

Determinations of the vital capacity by means of a spirometer, when used in connection with the mathematical expression given, will indicate approximately the maximum opening in the chest wall compatible with life if the mediastinum is not already stabilized by adhesions and induration. If such observations were made before open drainage is established in cases of empyema or before any thoracic operation, it is probable that many lives would be saved. Both theoretical conclusions and actual observations show that in empyema the



vital capacity is greatly reduced. That this reduction does not depend merely on the presence of fluid exudate in the pleural cavity is shown by the fact that an appreciable increase in the vital capacity occurs only gradually after the removal of the exudate. This fact is of importance as it constitutes an additional argument against the establishment of open drainage during the acute pneumonic stage of an empyema when the vital capacity is so low as to approximate the tidal air requirement. Extensive thoracoplastic operations result in an apparently permanent marked reduction in the vital capacity. They should be performed, therefore, only in the rarest instances and after other methods have been given an intelligent trial for at least many months.

C. R. STEINKE.

**LeFort, R.:** On the Extraction of Projectiles from the Thoracic Cavity, Particularly the Mediastinum. *Am. J. Clin. Med.*, 1920, xxvii, 662.

The progressive improvement in the author's results in chest surgery are due to the abandonment of narrow openings, especially the posterior incision, the perfection of technique, and above all the systematic employment of radioscopy during operation.

To prevent secondary chest deformities LeFort has given up resection of ribs and especially the resection of cartilage in all operations done anterolaterally.

Small bodies in the lung parenchyma may be seized with a forceps under screen control. When encapsulation has occurred resistance may be offered to the forceps and care is necessary not to drive the object deeper into the lung. The foreign body may be concealed by hæmorrhage, the vertebræ, the liver, or the heart.

Large rough bodies in the parenchyma may be digitally removed after the lung has been fixed to the chest wall by means of sutures. Such fixation prevents pneumothorax and the foreign body may fall free of the wall when the cavity is ballooned by the air.

For the removal of projectiles in the dangerous regions, the hilum, pedicle, and mediastinum, large transpleural openings are necessary. The pneumothorax is well tolerated. Incision in an intercostal space and through one or two adjacent costal cartilages provides good light and permits the formation of an osteoplastic flap. Mediastinal extractions must be carried out through anterior incisions. The author avoids fracture of the ribs, even green-stick fractures, and the use of drainage material in the pleura.

For difficult high mediastinal extractions LeFort forms a sternocleidocostal flap which make it possible to raise the clavicle and first rib without fracturing them and to approach the cervicomedial junction.

K. L. VEHE.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Beavan, P. W.:** Pneumococcus Peritonitis in Infancy and Early Childhood. *Am. J. Dis. Child.*, 1920, xx, 341.

In the last thirteen years 171 cases of general peritonitis have been treated at the Babies' Hospital in New York. Nine of these were proved by bacteriological examination to be due to the pneumococcus.

In this type of inflammation the entire peritoneal cavity is involved by a purulent fibrinoplastic exudate. If the patient lives, adhesions form in the exudate which limit the process, finally causing a localized abscess. In this characteristic, pneumococcal peritonitis differs from the other forms of purulent peritonitis observed in children.

While the source of the infection of the peritoneum is thought by most authorities to be the blood stream, there is controversy as to where the blood becomes infected, some believing the focus to be in the lungs, others tracing it to the middle ear, and still others finding it in the intestines. The cases upon which this article is based seem to indicate that in young children the infection originates in the lungs as in 7 of the 9 cases distinct pulmonary symptoms preceded the peritoneal inflammation.

The author gives the histories of the 9 cases. Clinically two types of pneumococcal peritonitis

were noted: (1) that which was clearly secondary to a pneumonia or empyema, and (2) that which was apparently primary or idiopathic.

The idiopathic type is discussed in some detail. This type was represented by 2 cases, both of which were fatal.

A. R. HOLLENDER.

**Foldes, D.:** Inguinal Hernia. *Surg., Gynec. & Obst.*, 1920, xxxi, 402.

The author has evolved a method of performing herniotomy in which he uses the best points of technique brought out by such men as Bloodgood, Halsted, and Berger. The steps of the operation are as follows:

1. Exposure of the external ring and aponeurosis.
2. An incision is made in the aponeurosis, beginning in the inner corner of the arc of the ring, so that a large lateral flap and a smaller medial flap are formed.
3. The cord is lifted out of its bed, without pulling on its distal end, by means of a tape inserted under it. An incision is made over the cord parallel with the vessels to expose the peritoneum. The peritoneum is then caught and in most cases is opened, the contents of the sac having been reduced previously if possible. The sac is separated as far as the epigastric artery, resected, and ligated.
4. If the rectus is found to form a part of the inguinal triangle, it is mobilized by making an inci-



sion from 3 to 6 cm. in length in its anterior sheath. This relieves the tension of the suture and allows the lower angle of the canal to be closed firmly. The Bassini sutures are first placed and then tied, beginning with the suture where the distance between the muscle and Poupart's ligament is the shortest. All sutures are placed below the cord. The uppermost suture in the internal oblique and transversalis muscle to Poupart's ligament is placed in such a way that when it is tied the cord is displaced higher. As a rule four single sutures are sufficient.

5. The lateral flap of the aponeurosis is sutured to the internal oblique and the rectus muscles beneath the cord. Continuous catgut is used for this step.

6. The cord is placed on the wall thus prepared and covered with the internal flap of the aponeurosis.

7. The skin incision is sutured with silkworm gut and black thread.

Whenever possible, local anaesthesia induced by Braun's technique for nerve blocking is employed.

I. W. BACH.

### GASTRO-INTESTINAL TRACT

**Bastedo, W. A.:** The Determination of the Need of Surgery in Peptic Ulcer, with Remarks on Gastro-Enterostomy. *Am. J. M. Sc.*, 1920. clx. 491.

Considering all the possible postoperative complications, such as hernia, rectus diastasis, gastro-intestinal fistula, and various abdominal adhesions, the operative mortality, and the number of cases after a period of relief showing relapse similar to that following medical relief, Bastedo believes that surgery must not be too lightly resorted to in a case of peptic ulcer. He does not wish to disparage the use of operation in the proper case, however, and agrees with Crohn that it would be impossible to treat disorders of the stomach without gastro-enterostomy. Its value, however, is to make an exit for food when the normal exit is not available. Bastedo holds with Torek that "the treatment of ulcer of the stomach is essentially medical and not surgical, and that it is only certain of its complications or sequelæ that require surgical intervention."

Bastedo is of the opinion that cases of ulcer which require operation are emergency cases, those in which surgery is imperative from the outset, and those in which surgery should be resorted to only after thorough medical treatment.

Surgery is imperative and medical treatment is futile in the following conditions: (1) chronic penetration shown by radiographs; (2) palpable induration; (3) adhesions which cause distortion of the stomach, interference with peristalsis, or much pain during the digestive period; (4) permanent hour-glass stenosis; (5) pyloric stenosis not syphilitic; (6) repeated copious hæmorrhages; and (7) conditions which suggest that an ulcer is becoming car-

cinomatous. In duodenal ulcer carcinomatous change is rare, but in gastric ulcer its possibility must induce an earlier consideration of surgery.

The majority of cases of peptic ulcer require surgery only after the failure of thorough and prolonged medical treatment. When a case is medical the symptoms are relieved by treatment (though the condition is not cured) very promptly. Therefore, on the one hand, the failure of medical treatment to relieve the symptoms suggests that the case is surgical, and on the other hand, when a case seems probably, but not definitely, surgical, a course of medical treatment is advisable to prove the point. If the patient shows a positive Wassermann reaction or gives a history or any physical evidence of syphilis, antileptic treatment should be tried.

Having been given a thorough medical trial, those cases should be considered surgical which continue to show: (1) persistent or recurrent hæmorrhage, even though slight in amount; (2) pain; (3) nausea; (4) pylorospasm of such persistence as to simulate pyloric stenosis; (5) discomfort following the ingestion of the ordinary wholesome foods; (6) discomfort following the ingestion of a sufficient amount of food to maintain nutrition during normal activity; (7) recurrence after an apparent cure.

As regards postoperative treatment the advice of Ginsburg, Cannon, Troell, W. J. Mayo, and Carter should be borne in mind. Ginsburg stated that "small quantities of food at frequent intervals have a better physiological effect upon the recently short-circuited stomach than three daily meals"; Cannon, that "after gastro-enterostomy effective action of the anastomosis demands that there shall not be more than a moderate distention of the stomach"; Troell, that "recurrence of symptoms following operation in many cases depends to a considerable degree on the surgeon's neglecting to give dietetic and other prescriptions suitable for ulcer"; W. J. Mayo, that "following surgical intervention the patient should be under good medical advice until permanent cure is assured"; and Carter, that "after operation every opportunity for healing and cicatrization should be given involving, as this does, weeks or months, during all of which the diet should be bland, soft, and free from thermal, mechanical, or chemical irritants."

E. C. ROBITSHEK.

**Gauss, J. H. P.:** The Diagnosis of Gastric Carcinoma, with Special Reference to the Roentgenology. *J.-Lancet*, 1920, n. s. xl, 576.

From 33 to 50 per cent of all carcinomata occur in the stomach. Of 23,598 patients admitted to the Mayo Clinic in a six months' period, 169 (0.71 per cent) had gastric carcinoma. In other words, 1 in every 140 patients with various complaints had carcinoma of the stomach.

No one of the clinical symptoms on which a diagnosis of gastric carcinoma is based is pathognomonic, and each is found in association with so many others that it has no separate value.



The most suggestive symptoms are unfortunately indicative of a late stage of the disease. It is in such cases that the roentgen ray proves its importance. There is no symptom which definitely demands a roentgenological examination. A patient of middle age or older should have the benefit of a roentgenological examination if he has had a stomach complaint for several weeks which has not been amenable to dieting or general hygienic measures and especially if it is associated with pain, vomiting, and loss of weight and strength. The examination should be made even if the symptoms are not marked and the patient is believed to be neurotic.

Gauss briefly reviews the technique of X-ray examinations and takes up the roentgenological signs of gastric carcinoma. The primary roentgenological sign is a filling defect. The presence of a filling defect which is found to be constant in several examinations and does not change in location or outline after manipulation by palpation or the administration of antispasmodics to physiological effect warrants a positive diagnosis of gastric tumor, especially if the filling defect coincides with a palpable mass. As 95 per cent of all gastric tumors are carcinomata, such a diagnosis is practically a diagnosis of gastric carcinoma.

In this study the differential roentgenological diagnosis of gastric carcinoma and the secondary roentgenological signs are considered. The presence of any of the secondary signs, especially decreased peristalsis and lessened flexibility, should rouse the suspicion of carcinoma, and if a filling defect is not apparent at first sight a search should be made for it.

The author formulates the following conclusions:

1. Since from 33 to 50 per cent of all cancers occur in the stomach and since cure depends on radical extirpation, an early diagnosis is essential.
2. Early cancer may be diagnosed with greater certainty by the roentgen ray than by any other single measure or combination of measures.
3. While roentgenological examination should be made by an experienced specialist, if possible, this is not always practicable. The novice, however, may attain a fair degree of success if he is conservative, uses common sense, and limits his positive diagnoses to cases in which he finds a permanent filling defect and there are at least suspicious clinical findings.
4. No patient should be sent to the operating table with a diagnosis of gastric carcinoma who has not had a thorough roentgenographical and roentgenoscopic examination.

**Sabin, F. R.: The Healing of End-to-End Intestinal Anastomoses, with Special Reference to the Regeneration of Blood Vessels.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 289.

In these studies it was shown that in the end-to-end anastomosis of the intestines the in-folding of the wall does not cause blocking of the lumen, the in-folded parts are viable, and the mucosa continues to function in absorption, but that the number of cells secreting mucus is very greatly increased.

Ultimately this change in functional adaptation is brought back to the normal by the death of the mucus cells and the regeneration of the mucosa.

It was shown that wherever the muscularis mucosæ was cut or ruptured without the occurrence of infection, the glands of the mucosa invaded the submucosa where they often formed cysts, but that these glands were subsequently restored to the mucosa by the regeneration of the muscularis mucosæ which made a barrier for the glands.

The histological technique showed that the cells of the smooth muscle are very sensitive to injury and that it is hardly possible to put a clamp on smooth muscle without producing changes recognizable under the microscope. It seemed to the author a very important point that the series of end-to-end anastomoses caused no dilatation of the wall of the intestine and hence no damage to the musculature sufficient to make it thin out. All of the cases showed gaps in the musculature where the stitches pulled through, but though this damage was inevitable, the fact that the muscle was syncytial and the stitches were limited to six points around the lumen of the gut seemed to limit the amount of destruction to the musculature more than in the end-to-end form of the operation.

In the regeneration of the vascular system it was shown that the regeneration of the vessels was limited to specific areas where the growth of new vessels was preceded by a return of the endothelium of the old vessels to the original angioblastic type which involved a very great multiplication of the endothelial nuclei. From these transformed vessels solid masses of angioblasts like those of the embryo grew out, acquired a lumen, as in the embryo, through liquefaction of the cytoplasm, and became new vessels, first capillaries and then arteries and veins.

G. E. BEILBY.

**Pototschnig: Spastic Ileus** (Ueber spastischen Ileus). *Deutsche Ztschr. f. Chir.*, 1920, cliv, 303.

Haidenhain first described spastic ileus in 1897. In 1902 Langemak was able to collect 12 positive cases. In 1915 Mathews reviewed all the case reports which had been published. The author discusses the relationship of spastic ileus to acute ileus in general and to ileus due to obstruction by foreign bodies. In the latter the foreign body is the cause both of obstruction and of spasm. Spasm is of importance also in the pathogenesis of intussusception.

The five groups of cases distinguished by Fromme are not distinct but differ greatly in their etiology. Some of the causes mentioned by various authors may be responsible also for intestinal paralysis. Pototschnig suggests as an etiological factor the Littré hernia and embolism of a mesenteric or omental vein. The various etiological factors point to involvement of the autonomic nervous system; a susceptibility to spasm.

When the spasm is situated in the jejunum the symptoms must be differentiated from those of acute dilatation of the stomach and arteriomesen-



teric thrombosis. The condition usually persists for several days before it results fatally. As a rule the formation of a jejunal fistula or an artificial anus causes the disappearance of the spasm. Occasionally, however, it persists in spite of this treatment for weeks or months. When the cause lies in the central nervous system, condition runs a chronic course.

In most cases there is tachycardia; occasionally bradycardia. A positive diagnosis is possible only at operation. The anatomical findings are intestinal spasm which varies in extent and location. As a rule it is found in the lower ileum. The large intestine is rarely involved. The spasm may appear simultaneously at different points or intermittently in one area. In the spastic area the intestine is firm and anæmic, while in the other portions it is distended and relaxed. The line of demarcation is always distinct. The findings at autopsy are similar.

The prognosis is always grave. Laparotomy is necessary. During this operation spontaneous relaxation of the spasm will be observed. Atropine, morphine, chloral hydrate, bromides, and heat may be given either alone or with operative treatment. Surgical therapy consists in the formation of a jejunal fistula or an artificial anus, entero-anastomosis, or resection. The danger that spasm may develop in another area, however, remains.

The author reports a case briefly as follows:

A soldier, 22 years of age, was suddenly seized after a heavy meal with severe gastric and abdominal cramps, vomiting, and general malaise. The bowels were obstructed and no flatus was passed. This first attack was followed by some subjective improvement but no bowel movement occurred in forty-eight hours. Subsequently there were two more attacks of vomiting and rapid loss of strength. The vomitus was green. The abdomen was distended and the muscles were tense, especially in the region of the appendix. The pulse was 128 and small. There was no fever. Diagnosis: peritonitis following appendicitis. The skin and mucous membranes were pale. *Facies abdominalis*. The tongue had a dark greenish coating. The abdomen was tense all over and sensitive to palpation. Tympany. No fluid was demonstrable. No stool was passed on rectal irrigation. Second diagnosis: intestinal occlusion. The patient was prepared for operation. Gastric lavage yielded large amounts of bile-stained fluid containing food rests and was followed by decided improvement. The tympanitis disappeared and sensitiveness to pressure remained only near the fold of Douglas. An exploratory laparotomy was done under lumbar anesthesia. With the exception of slight dilatation and ptosis of the stomach and old adhesions near the appendix no pathological condition was found. Appendectomy. At first there was improvement but on the second day the attack recurred and death resulted in spite of gastric lavage and cardiac stimulation.

At autopsy the peritoneum was found to be smooth and shiny. There was no exudate. Fifty

centimeters below the duodenojejunal flexure was a high-grade stenosis which gave the intestine the appearance of being ligated with coarse thread. The same picture was observed at the sigmoid flexure. There were no adhesions or scars. The spasms were overcome by simple traction on the bowel. Besides these stenoses there was no pathology of the intestinal tract.

The author is unable to account for the spastic ileus in this case but because of the disappearance of the spasm after gastric lavage and the negative findings at operation he is convinced that the diagnosis was correct. On the basis of Aschoff's studies he concludes that both of the spasms found at autopsy were present during life. The spasm of the jejunum was responsible for the clinical picture.

KLEINSCHMIDT (Z).

**Flesch-Thebesius, M.: Ileus Due to Adhesions and Bands** (Ueber Ileus durch Verwachsungen und Straenge). *Deutsche Ztschr. f. Chir.*, 1920, clvii, 60.

Of 368 cases of ileus operated upon at the Rehn clinic during the past fifteen years, 162 (44 per cent) were due to peritoneal adhesions and bands. Cases in which the condition followed an operation were twice as numerous as those in which it was not the result of an operation. The greater frequency of ileus following operation during the last two years of the war has been attributed to a decrease in mesenteric fat and the war diet which produced gaseous distention but the author ascribes it to disinfection of the skin with tincture of iodine which, entering the abdomen, may be the cause of exudation processes in the intestinal serosa, the introduction of ether into the abdominal cavity, tamponade, and extravasation of blood which favors the formation of adhesions. Such adhesions disappear spontaneously in the great majority of cases but occasionally produce kinking of the intestines necessitating operative interference. Therefore every factor favoring the formation of adhesions is to be avoided. In every laparotomy there should be perfect asepsis and hæmostasis and care should be taken to prevent contact between irritating chemical agents and the intestinal serosa.

The author does not favor the use of substances such as sterile oil, fluid lard, and ether to prevent the formation of adhesions, but recommends the stimulation of peristalsis by injections of physostigmin and enemas and the application of heat. In the Rehn clinic this treatment has reduced the number of cases of postoperative ileus to a low figure (22 cases in about 1,800 cases in four years).

In the 113 cases of postoperative ileus operated on in the past fifteen years the first operation was performed for appendicitis in 69. Ileus usually occurs within four weeks after the primary operation but in some cases may not develop until as late as ten years later. As a rule occlusion of the intestine results from the formation of broad adhesions between the loops of bowel or to the parietal peritoneum. In some cases there may be adhesion



to a drain and therefore drains should always be removed as soon as possible.

In discussing the other 44 cases of postoperative ileus the author makes similar recommendations. In this connection it should be borne in mind that adhesions may form even after an aseptic operation with primary union.

As a result of treatment in the 113 cases reviewed a cure was obtained in 83 cases (73 per cent). In the 49 cases in which the condition did not follow an operation the results were not as favorable, a cure being obtained in only 28 (57 per cent). The reason for this difference is not apparent. Frequently a cause for the adhesions cannot be found at operation; the most common etiological factors are parametric processes and abdominal tuberculosis.

KNOKE (Z).

**Cole, L. G., and Roberts, D.: Diverticula of the Duodenum; Their Clinical and Roentgenological Recognition.** *Surg., Gynec. & Obst.*, 1920, xxxi, 376.

The frequency of diverticulosis of the alimentary tract has escaped attention until recent years. The condition has been ascribed to various causes such as a congenital attempt to form a supernumerary pancreas, a local defect in the musculature, pouching due to age, atony, and intraduodenal pressure, an essential weakness of the fold of Vater, external traction due to disease of the gall-bladder or pancreas, pressure from partial obstruction below, and duodenal ulcer.

Duodenal diverticula are usually single and vary in size from 1 to 4 cm. in their greatest diameter. In those which are small the diameter of the opening may be as great as that of the rest of the pouch, but in large diverticula it may be much narrower. The mucosa and submucosa are normally present, but the musculature is usually absent, except for a few scattered fibers. The glands of Lieberkuhn are present, but the glands of Brunner are absent. Bits of pancreatic tissue are frequently found. There are two definite anatomical groups. In the first, the ostium lies close to the papilla of Vater and the pouch lies within the loop of the duodenum in close proximity to the head of the pancreas. The second group comprises those which lie at a distance from the papilla of Vater.

The symptoms are rather varied, ranging from fatal intestinal obstruction to persistent digestive complaints, regurgitation of food, and clinical evidence of chronic pancreatitis. In the examination a localized accumulation of opaque meal varying in size from that of a grape seed to that of a hen's egg is found adjacent to the duodenum. This condition must be differentiated from others in which similar findings are noted before the administration of an opaque meal, viz., renal calculi, gall-stones, calcified Gleason's capsule, fecaliths, and pancreatic calculi, and those in which they are noted after an opaque meal, viz., cases of deformity of the cap due to induration or cicatricial contraction due to

an ulcer, perforating ulcer with the formation of a small accessory pocket, perforation of a duodenal ulcer into the bladder, isolated collections of barium in the haustra of the colon several days after a meal has been given, and isolated collections of opaque meal retained in a crater of an ulcer on the posterior wall of the stomach or near the greater curvature.

R. R. MUSTELL.

**Spriggs, E. I.: Duodenal Diverticula.** *Brit. J. Surg.*, 1920, viii, 18.

Duodenal diverticula have been found ten times in the last 1,000 consecutive X-ray examinations of the alimentary tract made at Duff House. Although this condition is uncommon, it should be recognized as it may give rise to symptoms or the shadow may be confusing.

Duodenal pouches may be congenital or caused by ulceration or other pathologic conditions of the wall of the bowel and possibly by extrusion of the weak parts. These pouches are single or multiple, although generally they do not exceed two in number. They vary in size from that of a linseed to that of a hen's egg. Their mouths are usually wide enough to admit a finger tip and for this reason they drain easily and are usually harmless.

The author gives a brief description of the ten cases observed. The diverticulum was situated in the second or third parts of the duodenum in five cases each. In 9 cases the symptoms were not connected with the diverticulum.

MERLE R. HOON.

**George, A. W., and Leonard, R. D.: The Value of the Roentgen Ray in the Study of Diverticulitis of the Colon.** *Am. J. M. Sc.*, 1920, n. s. vii, 421, 505.

The term "multiple diverticulitis" is used to designate the presence of one or more sacculations projecting from the exterior of the gut and the associated secondary inflammatory changes. This condition is generally recognized as a distinct clinical entity. The authors give a brief résumé of the literature bearing on its clinical, pathologic, and roentgenologic aspects. The diverticula may be either congenital or acquired. The former type is not considered in this article. Acquired diverticula may be complete or "true" or incomplete or "false." They are found most commonly in the descending colon and sigmoid, but roentgenological examinations indicate that they occur in the ascending and transverse colons more frequently than has been generally believed. Their number is variable, the average being between 10 and 20. They vary also in size but those found at autopsy or operation are usually the size of a pea. As a rule they are round or ovoid. Some of them are distinctly pedunculated. The usual content is fecal matter. This may be so inspissated as to form fecaliths. Occasionally they have been found to contain foreign bodies.

Diverticula are not necessarily the cause of symptoms. Complaint is made only when secondary pathologic changes occur. These changes may be



in the nature of: (1) general peritonitis from infection extending through the thinned-out wall; (2) acute gangrenous inflammation due to strangulation of a pedunculated diverticulum; (3) chronic proliferative extramucosal inflammation; (4) adhesions; (5) perforations of an acute or chronic type; (6) chronic inflammation of the mesentery; and (7) the development of cancer.

As a rule the condition is noted in persons past middle life. Males are twice as susceptible as females. Obesity seems to be a predisposing factor. The arrangement of the muscle fibers, the points of entry of blood vessels, increased pressure from the contained gas and faecal matter may all have some relationship to their development. In certain cases there may be a congenital predisposition to them.

Multiple diverticulitis presents a fairly definite clinical picture. In a large percentage of cases there are attacks of pain of variable severity. In about 25 per cent a history of chronic constipation is given and in about 30 per cent of the cases with symptoms a palpable tumor is found in the left side. Secondary complications show their usual clinical signs. In the differential diagnosis carcinoma of the colon is the important condition to be ruled out. Absence of cachexia and non-passage of macroscopic blood are important distinguishing signs.

Colon diverticula are found by the roentgenologist in the course of routine examinations of the intestines. It is important to make a preliminary roentgenographic and roentgenoscopic examination of the abdomen as in this way the presence of faecaliths in the diverticula may be shown and other shadows which might lead to confusion after the barium meal has been given may be recognized. The ordinary buttermilk-barium opaque meal is used. The best filling of the colon is shown usually at the end of twenty-four hours and it is at this time also that the diverticula are first visualized. Some of the latter may be seen only by displacing part of the gut by palpation. Plates made from thirty-six to forty-eight hours after the meal show the diverticula to the best advantage as the adjacent bowel is empty at that time. In some cases the barium meal may be retained in the pockets for weeks. The examination with the barium meal should always be followed with the barium enema. In this way some of the secondary changes, such as chronic thickening of the intestinal wall with narrowing or beginning obstruction, abscess cavities, chronic perforations, and fistulae may be brought out.

On the basis of their radiographic appearance cases of multiple diverticula may be grouped roughly into three general classes:

1. Cases of simple diverticula formation. Round discrete sacculations of variable size and number in close proximity to the intestinal wall but distinctly outside the lumen of the intestine are present. These may not produce symptoms. They are to be differentiated from isolated masses of barium in the colon. The latter are distinguished by their inconstancy.

2. Cases showing beginning secondary changes of an inflammatory nature. The diverticula in this group are usually localized along the lower descending colon and sigmoid for a distance of 2 or 3 in. Associated with them is a beginning narrowing of the lumen of the intestine. There may be fixation from adhesions and demonstrable rigidity of the intestinal wall. Invariably there are more or less definite symptoms. A common symptom is localized tenderness.

3. Cases showing advanced secondary inflammatory changes such as pericolicitis, tumor, and obstruction. The characteristic findings in this group are chronic obstruction and the symptoms produced by it. Stasis proximal to the obstruction possibly associated with dilatation is the roentgen finding presented. The colon has a peculiar serrated appearance for several inches and shows narrowing of the lumen. This is best revealed by the opaque enema; it remains constant and palpation under the fluorescent screen usually demonstrates that the intestine is more or less like a rigid tube. The authors regard this finding as almost pathognomonic of chronic diverticulitis even though the diverticula are not visualized. Other complications, such as adhesions to adjacent viscera and chronic perforation with abscess cavity formation or fistulous tracts, may also be demonstrated by the roentgen examination. In the cases belonging to this group there are usually definite symptoms and at times these may be severe. Some of the attacks may simulate appendicitis on the left side. The roentgen examination aids greatly in clearing up the diagnosis.

It is important to differentiate cases in Groups 2 and 3 from cases of carcinoma of the colon. This is not always possible with the roentgen ray alone. As a rule carcinoma is a circumscribed growth which is intra-intestinal, shows abrupt transition from the normal portion to the diseased portion of the bowel, and is rapidly progressive. Diverticulitis usually progresses slowly, is less definitely localized, extends outside of the intestinal wall, shows a less abrupt transition from the normal to the diseased portion of the bowel, and causes less severe obstruction.

In conclusion the authors state that, in general, it must be borne in mind that the diagnosis of multiple diverticulitis is not to be based on the roentgen-ray findings alone, even though in some cases this may seem possible. The roentgen-ray evidence should be considered in conjunction with the history, the physical examination, and laboratory findings. This is of particular importance in the differentiation of multiple diverticulitis from cancer.

The article is supplemented with an extensive bibliography.  
ADOLPH HARTUNG.

Bennett, R. A.: *The X-Rays and the Appendix.*  
*Brit. M. J.*, 1920, ii, 316.

A note of warning is sounded to those who draw conclusions as to lesions in the alimentary canal



examined under abnormal circumstances and reacting to abnormal stimuli. Bennett urges consideration of the effect of a large mass of barium in any portion of the alimentary canal and the violence to which the ileocecal region is frequently subjected by massage, etc. The barium salt should be given with the patient's usual breakfast rather than in special media and purgation should not be done within twenty-four hours of the examination as it is best to observe the alimentary canal under conditions as normal as possible.

Fluoroscopic examinations are of prime importance, skiagrams being of comparatively little value. As refuting the claims of certain authors that in 75 per cent of cases it is possible to demonstrate the appendix by the opaque meal, Bennett gives the following table which is based on 50 cases subsequently operated upon:

Appendix visible. . .	22	Appendix invisible. . .	28
Appendix diseased. .	20	Appendix diseased. .	15
Appendix normal. . .	2	Appendix normal. . .	13

In 15 consecutive postmortem examinations preparations were made of the bowel in the cæcal region and barium was poured into the cut end of the ileum. In 4 diseased specimens the barium overflowed into the appendix; of the remaining 11 specimens, which were apparently normal, there was no overflow in 7 and the other 4 filled as readily as the diseased specimens. The visibility of the appendix is, therefore, not of great moment.

Of chief importance in the author's opinion is the mechanical effect of a diseased appendix, namely interference with the function of the ileocecal valve and the ileocolic muscle. As these structures have two antagonistic nerve supplies, the sympathetic and the parasympathetic, they are normally in a state of delicate adjustment which is easily upset by any pathologic change. Thus, overaction of the parasympathetic system inhibits the function of the sphincter and permits regurgitation from the cæcum; conversely, overaction of the sympathetics leads to spasm causing retention of intestinal contents in the ileum.

R. M. NICHOLS.

**Clemons, E. J.:** *Haemorrhoidectomy.* N. York M. J., 1920, cxii, 613.

Clemons instructs his patients to take no laxative previous to operation, to eat as usual, to take a tub bath the night before, and to have dry toast and black coffee for the previous meal. Just before the operation a 2-qt. enema of cold water should be given, the patient being placed on the left side with the knees flexed on the abdomen and separated by two pillows.

Instructions regarding the technique of the operation are given as follows:

Stage 1. Touch with phenol a point upon the skin  $\frac{1}{2}$  in. to the left of the anus, and inject the area through this point with one-eighth of a 1 per cent solution of quinine urea hydrochloride. Then

pass a double ligature of No. 2 ten-day chromic catgut through the deep fascia, beginning at the juncture of the hæmorrhoid and the raphe below the anorectal line and coming out at the juncture of the raphe above the hæmorrhoid at the level of the anorectal line.

Stage 2. Place a forceps on each end of these ligatures. Grasp the skin with a volsellum at the level of the anorectal line, one blade at each exit of the ligature. Cut the skin up to the ligatures.

Stage 3. Grasp the hæmorrhoid with sponge holders and make traction slowly and steadily outward and downward until normal mucosa is exposed. Tie each ligature separately around the base of the hæmorrhoid. Make the first knot slowly to produce pressure anæsthesia.

Stage 4. Cut away the hæmorrhoid just external to the ligatures, leaving its stump free. Remove the volsellum. If there is spurting from the inferior hæmorrhoidal artery, clamp and ligate it. Do not interfere with postoperative oozing.

This procedure is repeated for each hæmorrhoid except when there are hæmorrhoids of the first and second degrees. In the latter case the two right hæmorrhoidal areas should be removed at one time, twice the amount of tissue being excised on the right as on the left side.

C. R. STEINKE.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Reinhold, C. H.:** *The Modern Surgical Treatment of Tropical Abscess of the Liver.* *Guy's Hosp. Gaz.*, Lond., 1920, xxxiv, 356.

Tropical abscess of the liver has been disseminated by the Eastern troops in the great war so that there is now a possibility that it will be observed more generally. The author describes the etiology, symptoms, and morbid anatomy of the condition at some length.

The proportion of single abscess to multiple abscesses is about 3:2. As a rule the pus is sterile. The onset is insidious. Subsequently there is evening fever preceded by shivering and followed by the most profuse drenching sweats and a dull boring pain. The liver is enlarged mainly upward, giving a dome-shaped dullness at the base of the right lung. The X-ray may reveal this tendency early, and later may show increased areas of density indicating the points of abscess formation. The situation of the abscess may be indicated also by an area of acute tenderness and a patch of œdema.

Polymorphonuclear leucocytosis differentiates the condition from malaria and the anæmias. Malaria is the infection most often confused with tropical abscess of the liver but may be excluded by intensive quinine treatment. This method should not be necessary, however, as malaria has a characteristic blood picture and is associated with enlargement of the spleen and an earlier afternoon rise in temperature.



The treatment of tropical abscess of the liver is becoming more medical and less surgical. Emetine has a specific action on the *entamoeba histolytica* and controls the dysentery efficiently, thus reducing the abscess sequel. Vigorous treatment with hypodermic injections of 1 or 2 gr. daily has caused absorption in the early stages of abscess and averted the necessity for operative treatment. In other cases it has made it possible to limit surgical treatment to simple aspiration.

The surgeon must discover the situation of the pus. In the absence of localizing symptoms an exploratory puncture should be made backward and slightly upward in the eighth interspace in the anterior axillary line. This should be done on the operating table with everything in readiness to proceed if pus is found. A needle of large caliber not less than 4 in. long should be used with a clear glass syringe and should be pushed in deep. If no pus is found the needle should be withdrawn slowly as the abscess may have been transfixed. At least six trials in different directions should be made as sometimes patients are benefited by the puncture even when pus is not found.

When pus is present the treatment of choice is aspiration with the aspirator and vacuum bottles as in pleuritic effusions, combined with vigorous emetine treatment, three or four daily doses of  $\frac{1}{2}$  gr. When the abscess cavity is large, emetine hydrochloride may be injected (1 gr. to the ounce). After the needle is withdrawn the puncture is sealed with collodion.

As the pus is usually sterile, the risk of pleural or peritoneal infection is not great. If the abscess refills, re-aspiration should be done rather than open operation.

If the pus is foul and infected, open operation and drainage are indicated. The needle is left in place as a guide, and sinus forceps are passed through the skin incision which is parallel to the ribs. The cavity in the liver is gently enlarged with the forceps followed by the finger, and a flat metal drainage tube is inserted. If a tube of this kind is not available, it will usually be necessary to resect a portion of the rib to prevent compression of the rubber drainage tube which must be used instead. Emetine should be employed as in other cases.

If the fever and symptoms continue, further search is necessary, possibly with abdominal section for palpation of the liver. Aspiration should again be given a trial, though generally open drainage is necessary.

If pus is not found in the right lobe, the left or the lobus Spigelii should be explored, such exploration usually necessitates abdominal incision. In cases of this type the prognosis is not so good.

In the more severe cases with rapid destruction of the liver and peritonitis, the latter must be treated on general lines. The prognosis is grave. In other cases with slow progress the pus has been known to track up under the trapezius muscle or into the gluteal region.

M. H. HOBART.

**Macleod, N.: Third Note on the Radiography of the Gall-Bladder.** *Arch. Radiol. & Electrotherapy*, 1920, xxv, 141.

This note is for the most part a sequel to Davidson's contribution to the stereoscopic aspect of radiography, the importance of which in differentiating gall-stones from renal and other stones is not yet recognized as it should be. Of 41 cases in which the gall-bladder was examined at the Shanghai General Hospital between June 5, 1918, and March 27, 1920, biliary colic was absent in the majority, a liver abscess was suspected in 1, and positive radiographic findings were present in 3. Thirteen may be dismissed without detailed reference as neither operated on nor calling for further mention except that biliary colic was present in only 2; in 7 the picture was so complicated with intestinal gas in the gall-bladder region that it was impossible to complete the examination; and in 1 a large liver and fluid in the peritoneum made it impossible to obtain a satisfactory plate. In 8 suspicious shadows were noted in the region of the twelfth rib. In 6 of these it was evident from their great depth that they were not due to gall-bladder abnormality. Five patients who were requested to return for further examination did not do so.

The author gives the detailed histories of 10 cases which are of interest chiefly from the point of view of the differential diagnosis and their bearing on single-plate roentgenograms. Of 118 cases submitted for examination of the gall-bladder region, positive radiographic results were obtained in 63 (and confirmed in 1 case by the passage of a calculus in the stool), an operation was performed on 27 and confirmed the radiographic findings in 24; stones were found in 2 in which the radiographic result was negative; and in 1 a shadow thought to be due to a gall-stone of low density was found to correspond in position to a local thickening of the excised gall-bladder wall.

Assuming that only the results confirmed by operation can be relied on, it is evident from their numbers that they justify the demand for a radiographic examination of the gall-bladder region whenever possible.

The procedure is as follows:

The patient is thoroughly purged and an examination made when the stomach is empty. Most of the plates are made with the plate behind the patient and firm compression in front. The more recent cases were all examined stereoscopically. With time exposures, the author has found that there is penetration with a spark gap of  $4\frac{1}{2}$  in. When the negative showed the muscles, transverse processes, twelfth rib, and kidney shadow in part or whole in fair detail, a liver shadow not too dense, the spinal shadow not too far to the left of the center of the plate, and the absence of a suspicious shadow in the gall-bladder area, no further examination was made unless the patient had given a typical history of biliary colic or involvement of the stomach, duodenum, or colon. In such cases when the opaque



meal was used. Air or gas in the colon was found to be more of an obstacle than aid in the diagnosis of gall-stones.

ADOLPH HARTUNG.

**Lyon, B. B. V.: Can the Gall-Bladder, Biliary Ducts, and Liver Be Medically Drained?** *Am. J. M. Sc.*, 1920, clx, 515.

In this article, the fifth of a series of papers on the gall-bladder, Lyon presents a further consideration of certain aspects of diagnosis and treatment of cholecystitis and choledochitis by a method of physiological drainage.

The stimulus for the work was derived from that of Meltzer who, in experimental observations on dogs published in 1917, found that by directly douching the duodenum with a solution of magnesium sulphate he could cause "a completely local relaxation of the intestinal wall" and suggested using the method in jaundice and biliary colic by means of the duodenal tube. The mechanism is explained by Meltzer's "law of contrary innervation."

From a study of 309 cases, with a total number of 2,240 biliary drainings by this method, Lyon has become more and more convinced of the practical ease with which both the normal and the pathologic biliary apparatus can be drained of its contents except in the small group of disease states in which it is manifestly impossible to empty the gall-bladder. He believes further that it is possible to segregate for study the bile obtained from the duodenum, the bile ducts, the gall-bladder, and the liver to the extent that one may infer that the larger amounts of the various types of bile recovered from a biliary tap are derived from one of the sources mentioned. From cytological, cultural, and chemical studies of these various portions of segregated bile, he is of the opinion that it is possible to make certain inferential diagnostic deductions as to the condition of health, physiological or otherwise, or the condition of disease.

When a duodenal tube is passed through the pylorus of the stomach during its interdigestion or fasting period, it should find in states of health the sphincter of the bile duct closed and the duodenum free of bile. Within a few minutes after irrigation of the duodenal mucosa with a solution of magnesium sulphate of various strengths, however, it will be possible to recover bile either by gravity drainage or by gentle vacuum suction, a fact indicating that the tone of the sphincter of the common duct has been inhibited, its walls are relaxed, and bile has been forced into the duodenum. To relax the common duct Lyon has used in most cases a solution of magnesium sulphate varying in strength from 12.5 to 50 per cent of a saturated solution in amounts between 50 and 100 mls. The stronger solutions of 25 to 37.5 per cent have given an optimum amount of sphincter relaxation which lasts for a period of one or two hours. Through the glass window cannula placed about 8 in. from the proximal end of the tube the changes in color and viscosity and the gross abnormal elements in the bile

being recovered may be observed. For differential study the various specimens may be received in separate receptacles or vacuum bottles.

The first bile recovered, apparently that lying in the ducts, especially in the common duct which is the first source of supply, is usually diluted with a few milliliters of the magnesium sulphate solution, but its color gradually deepens until it becomes apparently a pure bile of a light golden-yellow color and of medium viscosity like that of syrup. Coming from healthy bile ducts it is perfectly transparent unless there is an admixture of acid chyme. After about 10 to 30 mls of this, the bile suddenly deepens to a considerably darker golden-yellow and becomes noticeably more viscid, usually draining steadily, though sometimes with slight intermittency, for 30 to 166 mls. A sudden transition in color and viscosity is then noted again, this change being to a light, transparent lemon-yellow, distinctly more limpid and thin than either of the other types and flowing with greater intermittency (a few milliliters to several ounces) as long as the relaxation of the common-duct sphincter is maintained. In the author's opinion the darker colored bile comes from the gall-bladder wholly or in part, but is probably mixed with a few milliliters of bile still delivered from the ducts or freshly secreted from the liver.

The results of this method of treating simple catarrhal jaundice (duration reduced by 52 per cent in one group as compared with a second group of cases treated in the usual manner) have already been reported. The author has found the method of value in typhoid cases and "carriers," and in connection with the dietetic management of subacute and chronic infections which tend to create a state of gastric subacidity. In non-obstructive duodenal ulcer cases in which duodenal feedings are being given he drains the gall-bladder once a week.

The method described furnishes a means of investigating physiological alterations of function in the gall-bladder, liver, and ducts and adds greatly to our medical armamentarium, particularly in the treatment of the recognizable early states of biliary stasis. It cannot and need not supersede surgery. The method is presented: (1) as a means of diagnosing biliary diseases to supplement the usual clinical methods and the information furnished in many cases by the roentgenologist; (2) as an alternative method of treating many types of gall-bladder and duct disease in which there is a question as to whether surgery is or is not emphatically indicated; and (3) as a supplementary method of postoperatively continuing the surgical principles of drainage in cases incompletely cured by surgical measures alone.

W. H. NADLER.

**Steindl, H., and Mandl, F.: Pancreatic Cysts** (Ueber Pankreascysten). *Deutsche Ztschr. f. Chir.*, 1920, clvi, 285.

To the 260 cases of pancreatic cysts collected from the literature in 1912 by Gulewe the authors add 7 new cases from the Hohenegg clinic.



The condition affects both sexes about equally. The average age of incidence is between the thirtieth and fiftieth years. While other investigators believe that in the majority of cases the etiological factor is trauma, in the cases studied by the authors an injury was mentioned in the history in only one instance and in the others the condition had its origin in some acute or chronic pancreatic disease such as congenital lues, alcoholism, and infections. The presence of pancreatic cysts is characterized by pain in the upper abdomen caused by pressure on the coeliac plexus, vomiting, and a palpable tumor in the region of the pancreas. As a means of confirming the diagnosis exploratory puncture is to be condemned. Instead, the gastro-intestinal tract should be distended with air. The X-ray examination is of only secondary importance. Glycosuria and fatty stools are never observed. A positive diagnosis is possible in only about 50 per cent of the cases. In the differential diagnosis ovarian cyst, echinococcus cyst, and aneurism must be considered.

Operation alone offers a chance of cure. Suturing the cyst to the abdominal wall and drainage is preferable to total extirpation with its high mortality. The persistence of fistula drainage is a very unpleasant complication but by diminishing the carbohydrate intake the pancreatic secretion and the irritation of the fistula may be decreased, especially if this antidiabetic diet is supplemented by the administration of sodium bicarbonate. A favorable effect has been observed also when, in addition, crepton is given both by mouth and by rectum. The long persistence of the fistula influences the patient's

condition and nutrition unfavorably and to a certain extent accounts for the relatively high mortality some time after the operation. In the authors' opinion the reason for this lies in the fact that at operation only the cysts are removed and the underlying condition causing them—pancreatitis—is not remedied.

KNOKE (Z).

### MISCELLANEOUS

**LeWald, L. T.:** An Experimental Study of the Duration of Artificial Pneumoperitoneum. *Am. J. Roentgenol.*, 1920, n. s. vii, 502.

With regard to the induction of pneumoperitoneum for diagnostic purposes the author conducted experiments on dogs to determine the minimum amount of gas necessary, the kind of gas, the time the gas remains in the peritoneal cavity, and the most suitable position in which to place the subject to determine the nature of a particular lesion. These experiments led to the following conclusions:

1. The presence of gas in the peritoneal cavity after the injection of oxygen can be demonstrated as late as eight days after the original injection.

2. A very moderate amount of gas is sufficient for diagnostic purposes. A proportion of about 2 c. cm. of gas to 100 gm. of body weight appears to answer the requirements.

3. The withdrawal of the gas appears advisable unless a rapidly absorbed gas, such as carbon dioxide, is used.

4. The use of a gas more readily absorbed than oxygen appears desirable.

ADOLPH HARTUNG.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Bassler, A.:** The Colon in Connection with Chronic Arthritis (Arthritis Deformans). *Am. J. M. Sc.*, 1920, clx, 351.

In cases of arthritis deformans focal infections are commonly present whose surgical correction does not benefit the chronic condition but may cause decided improvement if the condition is recent.

In all of the author's cases the most common source of infection was the colon. In the order of their frequency, the organisms found were the bacillus aerogenes capsulatus, single gram-positive cocci and diplococci, the bacillus putrificus, pathogenic types of the bacillus coli communis, staphylococci, and streptococci.

That arthritis deformans is not the result of constitutional errors is shown by the blood chemistry findings. The etiological factor is probably a focal infection in the intestinal canal.

A manifest focus of infection should be treated surgically and if no benefit is then noticed, the stools and urine should be examined to determine the presence of a colonic disorder.

Dieting according to the type of bacterial infection in the intestine and bacterial treatment are of great value; constipation and debility should be treated by diet rather than by drugs. While a true cure cannot be obtained, the condition may be greatly improved.

SAMUEL KAEN.

**Cotton, F. J.:** The Surgical Aspects of the Charcot Joint and Other Syphilitic Bone and Joint Lesions. *Ann. Surg.*, 1920, lxxii, 488.

This paper is based on cases of Charcot joints which showed definite repair processes following treatment with salvarsan. An astonishing proportion of Charcot joints are associated with tabes. When the motor function has not been impaired, the latter condition may not be diagnosed and the problem seems to be only that of the joint. The cases reported may be described briefly as follows:

**CASE 1.** A man who had "dislocated" a hip while bowling. Supposedly this "dislocation" had been reduced. Examination showed a suggestion of Argyl-Robertson pupil, slight limitation of movement, and the absence of pain and knee jerks. A history of infection twenty years before and of severe "neuralgia" beginning two years previously



was given. The patient was active and apparently healthy. The treatment consisted of rest in bed, fixation in abduction for three weeks, followed later by the use of a leather pelvic belt and crutches, and the administration of salvarsan. The destruction kept up for several weeks but finally ceased and the joint became firmer. The patient discarded the belt after four months. Today, after five years, he is as active as ever, though he still has a slight limp.

CASE 2. A widow, aged 52. This patient was referred for treatment of an eight-week-old fracture. The X-ray showed a Charcot-joint wrist. An operation was performed following treatment with salvarsan. The wound healed by primary intention. Following the operation a brace was applied. After three years the wrist was useful though a little weak.

CASE 3. The patient was a fireman who gave a history of infection about twenty years previously and had a Charcot-joint ankle. A mid-thigh amputation was done because of infection, but subsequently the great toe of the other foot became involved. After a course of salvarsan the X-ray shows definite repair. The foot is now protected by a strong boot and the patient is active.

CASE 4. Man, 40 years of age. A disturbance of function in the knee following lifting had been diagnosed as due to hypertrophic arthritis. The knee grew steadily worse though there was no great pain. After two months it was obvious that the condition was a Charcot joint. Knee jerk was absent and the pupils were characteristic, but there was no ataxia. The joint had considerable lateral motion. Salvarsan was given and the knee placed in a Thomas splint. At present the lateral motion is greatly reduced, destruction has been checked, and there is an increase in the density of the bone.

CASE 5. The patient was suffering from advanced tabes. The joints involved were the shoulder and those of the thumb. Treatment by fixation and salvarsan resulted in a reduction in the amount of shoulder motion and an increase in usefulness of the joints.

CASE 6. This was an early case of tabes with spontaneous fracture of the femur followed by prompt union and extensive callus formation. Fixation and salvarsan checked the progress of the condition.

CASE 7. The patient had had a Pott's fracture five months before. The limb was clumsy because of deformity but there was little pain. The Wassermann test was positive. A short course of salvarsan and fixation with a brace led to improvement.

CASE 8. In this case tabes was doubtful. The Wassermann test was weakly positive. The ankle was involved but there was very little pain on walking. This seemed to be a borderline case classed with Charcot joint clinically, but greatly resembling a non-tabetic specific bone lesion.

CASES 9 and 10. Treatment in these cases, which were non-tabetic, resulted in retrogression of the symptoms and of the process in the soft parts but not in the bone growth.

The lack of retrogression of the bone growth following treatment in the joint cases under discussion has led to the belief that syphilitic bone changes in the shaft are unaffected by treatment. The cases reported demonstrate, however, that proper treatment not only sets a limit to bone changes but leads to bone repair, the symptoms which persist being only those due to mechanical damage done before treatment was begun.

R. V. FUNSTON.

#### Henderson, M. S.: Tuberculosis of the Knee Joint in Children. *Minnesota Med.*, 1920, iii, 463.

Tuberculosis affects the vertebral column most frequently, the hip second, and the knee joint third. Tuberculosis of the knee joint is more common in children than in adults. The infection is hæmatogenous, and may be due to either the human or the bovine type of tubercle bacillus. The primary focus is in the lymph glands, usually the cervical, bronchial, or mesenteric group. Emboli may enter the general circulation through the thoracic duct. Infection may be brought about through contact and intimate association and through the diet, especially milk. It was estimated by Fraser that 62 per cent of infections are due to the bovine type of bacillus and 38 per cent to the human type.

The reason the bacilli select the bones and joints may be explained on anatomical grounds. Although the diaphyseal, metaphyseal, and epiphyseal circulations anastomose freely, the metaphyseal vessels are larger, the circulation slower, and the lodging of emboli in this area is thus favored. Hæmorrhage due to trauma in this region also favors the growth of bacilli. As the metaphyseal circulation comes directly from the periosteal structures, synovial and metaphyseal tuberculosis may be associated. Tuberculosis of the knee joint may be produced experimentally by injecting tubercle bacilli into the blood stream or trachea and traumatizing the joint. Tuberculosis rarely develops in cartilage, but in children the infection may be primary in the synovia.

Symptoms are usually noted following trauma which causes a slight displacement of the epiphysis leading to hæmorrhage in the metaphyseal region. These consist of stiffness, which may be neglected because it wears off in the course of the day, limp, local heat, and pain, which may be trivial. As the disease progresses deformities develop; first, swelling due to peri-articular thickening, then flexion and subluxation. The biceps being fastened to the head of the fibula causes external rotation and knock knee. The X-ray is of value in the diagnosis in the cases of adults but not in those of children. The von Pirquet test is a diagnostic aid but should not be relied on as conclusive. Laboratory tests of joint effusion are also valuable.

Tuberculosis may be simulated by syphilis, but the latter is usually bilateral. Still's disease may be distinguished by polyarticular involvement, glandular and splenic enlargement, and wasting. In sarcoma of the lower end of the femur or upper end of



the tibia, enlargement in one or the other of these bones will be noted on careful examination. X-ray study affords conclusive evidence as to the exact nature of the lesion.

Treatment must be continued until the symptoms cease. General treatment including fresh air, good food, especially fats, and proper surroundings, is of great importance. Local treatment is somewhat more complicated. A stiff-legged brace may be used. Plaster-of-Paris casts are perhaps the most convenient appliances to obtain fixation. The Thomas extension knee splint is good, but may cause relaxation of the joint. In the convalescent period the walking caliper splint is of value. In the acute cases the joint must be put at rest by means of Buck's extension with weights and pulleys. Aspiration and injection are indicated if the effusion is marked. In some cases of synovial tuberculosis aspiration and injection alone have effected a complete cure. Correction by force under ether is often the best method of obtaining the desired results quickly.

For fixation it is very important to use a full-length cast as the short cast is mechanically incorrect. The prognosis as regards complete cure is very good in cases treated early. In cases of long standing a relapse is apt to occur. PIO BLANCO.

#### FRACTURES AND DISLOCATIONS

**Moorhead, J. J.:** *The Management of Fractures of the Femur. Surg., Gynec. & Obst.*, 1920, xxxi, 288.

The author emphasizes the important part played by the Thomas splint in war fractures of the femur which were the most difficult of all fractures to handle. This splint reduced the mortality from 80 to 20 per cent, allowed ease and comfort during transportation, and permitted free access to the wound at all times.

Fractures of the femur have three zones of incidence, the articular ends and the shaft of the bone.

Fractures of the first, or upper-third zone, may be said to consist of: (1) fractures of the head or neck, capital and cervical cleavage; (2) fractures near the trochanters, juxta-trochanteric cleavage. Those of the second or middle-third zone consist of all fractures of the shaft between Zones 1 and 3, while those of the third or lower zone include fractures above the condyles (supracondylar cleavage) and fractures of the condyles (condylar cleavage).

The epiphyseal groups of fractures occur in the upper and lower zones and correspond respectively to the cervical and supracondylar varieties.

A fracture is a lacerated wound of bone and periosteum, the resulting deformity of which is due to a disturbance of muscular compensation. On the basis of their character, fractures are divided into two groups. Group 1 comprises those in which there is displacement of fragments, and Group 2, those in which there is little or no displacement of fragments.

In Group 1 we have the immediate problem of reduction and retention, while in Group 2 retention only is necessary.

A lacerated bone heals by primary union when its edges are brought into coaptation, and a compound fracture may be converted into a simple fracture by mechanical sterilization such as débridement.

Non-union usually means mal-union due to faulty reduction, faulty retention, or the interposition of soft or hard parts. Syphilis is not a common cause but cardiovascular disease is an important factor. In frequency, non-union of the femur is fourth on the list following that of the tibia, forearm, and humerus. The introduction of non-absorbable material to act as an internal splint is occasionally necessary but this should be the last resort even in selected cases.

The author effects reduction by either non-operative or operative methods. Non-operative or external reductive methods consist of:

1. Manual reduction, which is completed in one stage.
2. Traction and suspension methods in which straps with weights are attached to the limb so that alignment is attained gradually.
3. Traction in the Thomas splint.
4. Mechanical traction methods such as the use of the very efficient Hawley table.

Operative or internal reductive methods consist of:

1. Skeletal traction obtained by transfixing the bone (the Codivilla-Steinmann method), by tongs or calipers attached to the outside of the bone (the Ransohoff method), or by passing a metal band over the bone (the Finochietto method).

2. Internal adjustment by direct exposure and alignment of the fragments with or without fixation by absorbable material such as kangaroo tendon or bone, or non-absorbable material such as wire, nails, screws, clamps, bands, or plates.

The choice of method depends upon: (1) the patient's physique; (2) the site, extent, and duration of the fracture; (3) the patient's surroundings (home or hospital); and (4) the surgeon's experience.

In all cases in Group 2 Moorhead prefers the application of a plaster of Paris spica for a fracture of the neck of the femur and molded plaster of Paris anteroposterior splints for all others.

In Group 1 the method of choice is immediate preliminary traction in a Thomas splint or with adhesive straps with weights until permanent reduction can be made under anæsthesia, when a split plaster spica should be applied.

For the "irreducible" types of fracture skeletal traction by the transfixion method is preferable. The author prefers the Codivilla-Steinmann nail method. This he believes to be superior to the Pearson "ice tong" caliper which he claims slips and occasionally extrudes. The merits of the method are:

1. It does not require very great skill, special instruments, or prolonged anæsthesia.



2. It may be used for home treatment and when specially trained attendants are not available.

3. The nursing care is minimized because the patient has considerable freedom and is virtually in a semi-seated position.

4. The introduction of the transfixer at a distance from the actual site of the fracture does not re-traumatize an already damaged area.

5. It is safer and more certain than open operation.

6. It is relatively painless.

7. It permits inspection of the entire limb and joint freedom.

8. It combines reduction and splinting and requires only ordinary supervision.

The disadvantages of the Codivilla-Steinmann method are the danger of infection of the bone and damage to the popliteal vessels and joint bursae.

The Finochietto stirrup or the Chutro modification Moorhead does not regard as efficient as transfixion.

The article is concluded with the comment that the slighting of fractures by surgeons has led the orthopedists, who are better fitted for the after-care than for the initial care of this acute variety of traumatic surgery, to enter the field. The article is well illustrated.

L. D. PRINCE.

**Wehner, E.: Experiments Regarding the Healing of Fractures in Freely Transplanted Diaphyses of Bone** (Versuche ueber Frakturheilung am frei transplantierten Diaphysenknochen). *Arch. f. klin. Chir.*, 1920, cxiii, 932.

The large number of bone injuries sustained during the war and the frequency of delay in callus formation and union led the author to determine experimentally the course of fracture healing when the conditions regarded as necessary for callus formation are absent. The method chosen consisted of the free autotransplantation of a fractured metatarsal bone of the guinea pig. This bone with its attached periosteum was transplanted aseptically in fourteen experiments, being placed in some instances beneath the skin of the back of the same animal, in others into the parietal peritoneum, and in others in the muscles of the lower part of the thigh.

On histologic examination Wehner found subsequently that the endosteal cells, the medullary cells, and the elements of the haversian canals had become completely necrotic in the region of the fracture. Therefore these elements are unimportant in the formation of callus. The damage to the periosteum in the area of fracture was very severe but did not prevent regeneration of the osteogenetic periosteal tissue. While it is true that in the immediate area of trauma the regeneration was slight and in some cases entirely absent, it proceeded proximally very rapidly. The cellulofibrous layer of the periosteum united quickly with the vascular tissue on which the bone was grafted and from here sent out fibrous bands to the fracture ends, com-

pletely surrounding them. This happened in all cases in which no callus formation or fusion of the fragments took place.

In the experiments in which the fragments were laid side by side the cellulofibrous layer of the periosteum formed a limiting membrane between the two regenerating bone fragments, rendering their union by callus formation impossible. Fragments only slightly displaced behaved differently. In this case union resulted through callus formation, the callus arising from the osteogenetic periosteal tissue. All other osteoplastic elements in the area underwent necrosis. The callus was formed here as a result of a decided cellular increase in the osteoblastic layer of the periosteum of the fragments which led to fusion of their osteogenetic tissues.

In the case of the intraperitoneal transplants no callus formation occurred although the displacement of the fragments was slight. Probably this result was due to unfavorable nutritional conditions. In such cases the fragments were united by cellulofibrous connective tissue.

On the basis of these experiments the author has come to the conclusion that, with proper reduction of a fracture, bony union takes place even when the conditions believed to stimulate growth are absent, and that as in man such factors are never absent to the same degree as in the experiments reported and the conditions are much more favorable for healing, some other cause must be responsible for non-union. This cause, in Wehner's opinion, is severe injury to the periosteum of the ends of the fractured bones. The result of such injury is the interposition between the fragments of connective tissue without osteogenetic activity. Thus gaps are formed in the callus or a decided pseudarthrosis develops. The occurrence of fibrous pseudarthrosis in the case of a properly reduced fracture the author attributes to insufficient regeneration of spongy bone and the resulting interposition of connective tissue between the fragments rather than to a lack of functional stimulation.

HORMEIER (Z).

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Brooks, B., and Hudson, W. A.: Studies in Bone Transplantations: An Experimental Study of the Comparative Success of Autogenous and Homogeneous Transplants of Bone in Dogs.** *Arch. Surg.*, 1920, i, 284.

The studies reported in this paper were undertaken to solve the following problems:

1. The possibility of regenerating a defect in the shaft of a bone permanently by bridging this defect with a bone transplant taken from another animal of the same species.

2. The proportion of cases in which a successful result may be expected.

3. The influence of the ages of the donor and recipient on the success and failure of the transplantation of homogeneous bone grafts.



Dogs were used in all the experiments. The animals were operated upon in pairs, each pair consisting of an old dog and a young dog. A segment of each ulna from 2.5 to 4 cm. in length with all its periosteum was excised. In the case of each animal the operative procedure gave two transplants in similar defects in each ulna. One transplant was an autogenous graft, and the other a homogeneous graft.

As a result of these experiments the authors have come to the following conclusions:

1. A defect in the shaft of a bone of a dog may be permanently regenerated by a bone transplant removed from another dog.
2. The use of homogeneous transplants of bone was successful in 76.8 per cent of the cases while that of autogenous transplants was successful in 84.8 per cent.
3. The age of the animal is an important factor in determining the success and failure of the transplantation of autogenous grafts of bone in dogs.
4. The importance of the age of the donor or recipient in determining the success or failure of the transplantation of a homogeneous graft of bone in a dog is probably of less importance than the incompatibility of the tissues of different animals.

E. C. ROBITSHEK.

**Sexsmith, G. H.: Arthroplasty—A Safe, Sane, and Practical Surgical Procedure.** *J. M. Soc. New Jersey*, 1920, xvii, 333.

Sexsmith believes that the arthroplastic operation has fallen into disrepute largely because of improper choice and preparation of the substance interposed between the bone ends entering into the formation of the reproduced joints.

Properly performed, the arthroplastic operation is a practical and safe operation for both large and small joints. The author describes his own technique and compares it with that of similar arthroplasties performed by the late J. B. Murphy.

Operation should be delayed for six months after the subsidence of the active symptoms of the ordinary types of arthritis causing ankylosis, and for one year when the infection is due to the tubercle bacillus.

The following conclusions are drawn:

1. The operation relieves disability as much as, if not more than, the restoration of bone shafts in cases of ununited fracture and requires practically no greater skill.
2. A pedunculated autogenous flap for interposition between the bone ends in reproduced joints is superior to all other substances.
3. In the knee, special attention should be given to the re-forming of the bone ends, bearing in mind the possible tendency to lateral displacement.
4. The essential points in the successful arthroplastic operation are: (1) free incision of the soft parts with complete displacement of the bone ends; (2) ample space between the re-formed bone ends; (3) sufficiently large and thick pedunculated flaps to cover all denuded bone surfaces completely; and

- (4) in the large joints some form of traction to control the contraction of the surrounding muscles.

A. R. HOLLENDER.

**Wilson, C.: The Restoration of the Function of the Joints After Injuries.** *Internat. J. Surg.*, 1920, xxxiii, 314.

The author states that no problem in railroad surgery requires more skill than the restoration of an injured joint to normal function.

Today great effort is made to secure accurate anatomical adjustment. This is important, but the preservation of the function is also of great importance.

In simple sprains of joints and injuries to ligaments about joints or to tendons passing over them, protection by a proper dressing to enable the patient to use the joint without pain is the best treatment. The object of this procedure is to remove all strain from the torn ligament.

Partial or complete separation of a tendon attachment is a frequent injury. This is characterized by local tenderness on pressure and by tenderness when the involved tendon is stretched. The injury is best treated by a dressing which relaxes the tendon. When the knee or ankle is involved, relaxation of the injured tendon or ligament may be accomplished by raising the inner or the outer side of the heel.

When in the more serious injuries of joints the soft parts and ligaments are involved, absolute rest until reparation occurs is necessary. The formation of adhesions may be avoided by beginning movement at the right time. If movements are begun too early, fresh hæmorrhage and more granulation result; if movement is too long delayed, strong fibrous adhesions develop. Therefore the author advises a slight amount of movement as soon as the tenderness disappears. If there has been no tenderness, the range of movement may be increased the next day. During this time massage is of great importance.

If firm adhesions have been formed they may be broken up with care under an anæsthetic. Carrying the joint through one excursion of flexion and extension or rotation with a firm steady force is all that is necessary.

When a fracture extends into the joint or there is injury to cartilage, bony ankylosis may take place. Movement should be begun after a period of complete rest to allow for the absorption of blood clots and the disappearance of tenderness.

If ankylosis occurs the joint must be at the angle in which it will be most useful; in an ankylosed wrist the hand is of most use in dorsiflexion, while in ankylosis of the ankle the foot should be at right angles to the leg. The knee is most useful in full extension, and the elbow when flexed at rather less than a right angle. In ankylosis of the shoulder the arm should be abducted and rotated outward.

While fractures are uniting, muscles and joints should be kept in as normal condition as possible by massage and manipulation without disturbing the site of fracture.



Cicatricial contractions about joints following burns and injuries to the surrounding soft parts may be prevented by keeping the joints in proper position while the injuries are healing.

F. G. MURPHY.

**Dunn, N.: The Causes of Success and Failure in Tendon Transplantation.** *J. Orthop. Surg.*, 1920, ii, 554.

It is the author's opinion that the deformities resulting from paralysis bear a direct relation to the loss of muscular balance and that the deformity may be aggravated by strain of certain ligaments and by the force of gravity. Tendon transplantation should result in improvement by weakening certain muscle groups associated with the deformity and reinforcing the action of the muscle groups which are lost.

After correction of the deformity, the transplanted tendons should run a direct course to their new insertion and should not be subjected to strain until their new union is assured.

When a tendon is transplanted to perform a function of a muscle group normally in action with it success is very probable, but when the transplanted tendon is used to replace one not in normal action with it failure will result.

Two axioms are suggested:

1. A single tendon or part of a tendon should be used only to replace one of its own group, i. e., one normally in action with it.

2. A group of muscles but not an individual member of the group may be used to replace muscles not normally in action with it.

It is possible, however, to train an individual tendon to functionate in a group with which it is not normally in action. For this, special attention to re-education and co-operation on the part of the patient are necessary. The results of such training are most successful in the upper extremities.

Transplantation of the biceps into a paralyzed quadriceps tendon will not result in voluntary extension but transplantation of an active sartorius into a paralyzed quadriceps tendon will result in good extension.

For practical purposes, there are two groups of tendons for movement of the foot: (1) the anterior tibial group in action in dorsiflexion, and (2) the peroneal and posterior tibial muscles in action in plantar flexion. Any of the anterior group will successfully replace one another but no muscle from the posterior or peroneal group will replace a dorsiflexor. The posterior and peroneal muscles may be regarded as one group and used to replace one another. In cases of calcaneus deformity transplantation of all peroneal and posterior tibial muscles to replace a paralyzed tendo achillis is successful.

In the upper extremity individual action of muscles is more highly specialized and re-education of a muscle to function apart from its group is more practicable. In paralysis of the short extensors of the thumb portions of the radial extensors of the

wrist may be used and normal function is recovered. When there is loss of the power of flexion of one or more fingers, flexors of the same group must be used to replace them. The flexors of the wrist should not be employed for this purpose because they are normally in relaxation when the flexors of the fingers are acting.

F. G. MURPHY.

**Guradze: The Treatment of Deformed Fractures of the Femur** (Die Behandlung deformter Oberschenkelbrueche). *XV Kong. d. deutsch. orthop. Ges.*, Dresden, 1920.

The author discusses the causes and types of deformed fractures of the femur and the complications in the treatment. The causes of such deformities are, first, difficulties in the treatment, long and difficult transportation without sufficient fixation, and defective technique in treatment. Frequently the nature and extent of the injury make it necessary that the primary life-saving measures be supplemented by secondary orthopedic treatment.

The type of the deformity is usually dependent upon the location of the fracture and the amount of injury to the muscles. Complicated nerve and muscle injuries lead to paralysis, contractures, and the formation of flail joints. The method of treatment depends upon whether the bony union is firm or still soft, whether it is aseptic or infected, and whether or not an aseptic productive callus is present. When there is doubt as to the presence of infection, operation should be postponed. When an aseptic callus is present the X-ray should be used to determine whether it is capable of bone regeneration or not. If it is capable of bone regeneration the intracallus operation should be performed; otherwise a paracallus osteotomy. Dressing and fixation in plaster of Paris with traction is the method of choice. Other methods are extension effected by means of plaster, nails, or clamps, always in semiflexion. Osteosynthesis is better adapted to pseudarthrosis.

In discussing this paper Schulze stated that in fracture dislocations of the femur bony contact of fragments is desirable. Relative consolidation then results. The cast is applied under anaesthesia with central and peripheral extension. It must include the fracture, the entire pelvis, and the normal femur as far as the knee joint. Such a cast will allow any form of transportation.

SMON (Z).

**Ober, F. R.: An Operation for the Relief of Congenital Equinovarus Deformity.** *J. Orthop. Surg.*, 1920, ii, 558.

The author discusses the pathologic anatomy of clubfoot in detail and describes his own operation for the relief of the condition. This operation is not performed on children less than 2 years of age.

Congenital equinovarus deformity begins at the knee with outward torsion of the tibia and backward displacement of the external malleolus. In the foot there are three separate elements of deformity, viz., plantar flexion, adduction, and inversion.



Plantar flexion consists of the drawing up of the calcaneus posteriorly with forward subluxation of the astragalus maintained by the taut tendo achillis and the posterior tarsal ligaments which serve to force the astragalus forward from the natural mortise between the malleoli.

In the adduction element the scaphoid is subluxed inward and articulates with the medial aspect of the head of the astragalus while the cuboid is subluxed inward and articulates with the medial aspect of the anterior articular surface of the calcaneus. This adduction is made by the contracted anterior and posterior tibial tendons, the inner half of the plantar fascia, and the deltoid, calcaneo-scaphoid and astragalo-scaphoid ligaments.

The factor of inversion consists in subluxation of the os calcis beneath the astragalus held by the contracted tibial tendons and the deltoid ligament.

Ober's operation consists essentially of the division of the deltoid, astragalo-scaphoid, and calcaneo-scaphoid ligaments. An incision down to the deep fascia is made behind the internal malleolus and curved forward to end over the internal cuneiform. A second incision made across the medial tibial surface is curved down to end at the inferior border of the scaphoid and thus divide the deep fascia and the deltoid ligament. The deep fascia and periosteum are denuded from the malleolus, the inner aspect of the astragalus, and the sustentaculum, down to the internal surface of the calcaneus. The astragalo-scaphoid ligament is removed subperiosteally, the plantar fascia divided subcutaneously, and the tendo achillis cut. The periosteal-ligamentous flap is sutured to the anterior portion of the deltoid ligament. Routine postoperative treatment is carried out.

Clubfoot in general has an inherent tendency to recur. There cannot be too much over-correction. A cure is complete only when the patient is able to over-correct the deformity voluntarily. In the operation described the foot is lengthened, any degree of over-correction may be obtained, and the removal of contractures makes possible the anatomical replacement of the displaced bones.

R. G. PACKARD.

**Toupet, R. Arthrodesis of Torsion and Limitation of Extension Movements of the Foot Effected by the Use of a Tarsal Dowel** (Technique d'enchevîtement du tarse réalisant l'arthrodèse de torsion et la limitation des mouvements d'extension de pied). *J. de chir.*, 1920, xvi, 268.

When an orthopedic apparatus is not serviceable and surgery is necessary in cases of paralytic equinovarus or loose foot the author has found total arthrodesis and tibiotarsal, subastragaloid, and mediotarsal arthrodesis unsatisfactory. For a long time he has sought an operative method which would limit tibiotarsal movements to the useful portion of the foot and has finally devised a procedure which appears to him extremely simple and rapid. To date, he has applied this method to only 3 cases and

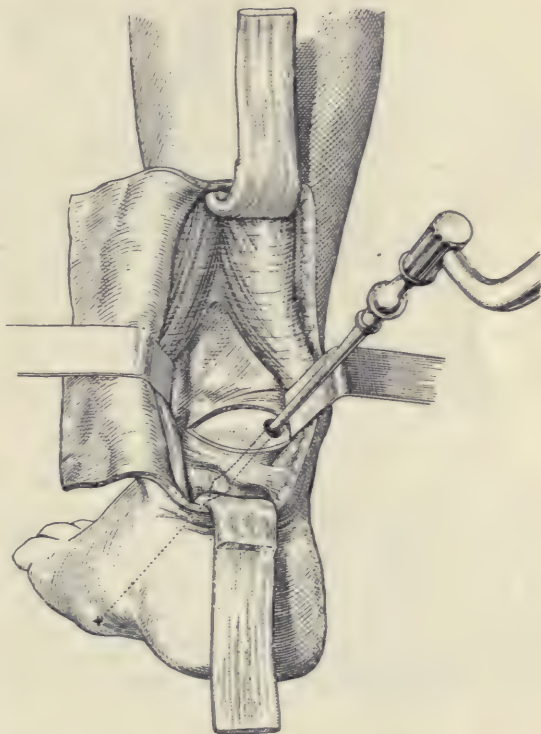


Fig. 1. The foot is at a right angle and the tibiotarsalis articulation is exposed. The perforator is inserted at the inner side of a median line and is directed toward the prominence of the fifth metatarsal.

as the operations date back only from three to six months they are too recent to warrant definite conclusions as to their end-results. However, Toupet believes it is well to make the method known on account of the ideal immediate results it has given.

The operation consists in inserting a bone dowel through the upper surface of the astragalus so that it reaches the cuboid after having traversed the great apophysis of the calcaneum. At the astragalus it is allowed to project about 1 cm., and on this projection the posterior edge of the tibia rests.

By this method the author has effected arthrodesis of the two articulations of torsion and has limited the extension of the foot.

In one of his cases Toupet used a living autogenous bone graft removed from the tibial crest on the normal side, and in the others, pieces of dead bone. The graft was prepared with Albee's dowel cutter. Its length was carefully calculated from a radiograph but the bone was always removed a little long and then reduced with the gouge. The best portion of the tibial crest from which to obtain such a graft is the central portion. When ready for insertion the dowel was about 6 or 7 cm. in diameter and perfectly round; the projecting end, however, was



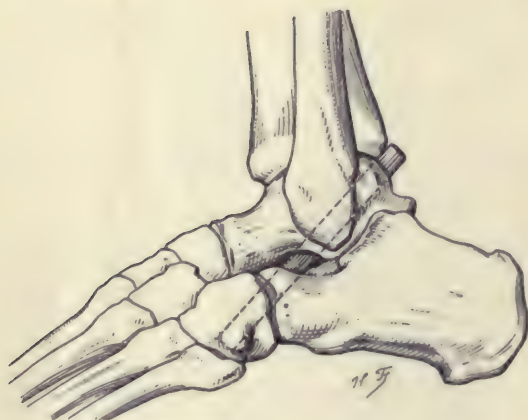


Fig. 2. Side view of the projecting dowel.

left rough. The achilles tendon was cut and turned back above and below as shown in the illustration. After exposure of the astragalus the foot was held by an assistant very exactly at a right angle and in correct position with neither varus nor valgus, and the boring of the tunnel was begun, the tuberosity of the fifth metatarsal being used as a guide. The perforation was made at a point within the median

line so that the dowel would have an oblique trajectory. The extent of the boring was determined by calculating the astragalo-cuboid distance from the radiograph and adding 2 cm. to allow for the slant of the trajectory. There is no danger that the perforator will do any serious damage on its way.

After the insertion of the dowel a simple dressing was applied. Immobilization was not necessary. Beginning on the next day the foot was exercised morning and evening to prevent retraction of the sutured achilles tendon. Active movement by the patient was permitted after ten days.

The ultimate fate of the projecting extremity of the dowel on which the posterior edge of the tibia rests and which therefore limits the movements of extension is as yet unknown. The author believes this portion will persist for years and that if it is absorbed the absorption will be a very slow process and will not occur until after the function of the dowel has been fulfilled. Numerous cases have been reported in which a projecting portion of a bone graft has persisted after the absorption of the rest of the graft.

In the author's opinion the type of arthrodesis described has numerous indications and is of value especially for the correction of paralytic club-foot, equinovarus, or other deformities due to infantile paralysis, and certain forms of equinovarus resulting from Little's disease.

W. A. BRENNAN.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Goerres: Our Experience with the Albee Operation in 60 Cases of Tuberculosis of the Spine** (Ueber unsere Erfolge mit der Albeeschen Operation in 60 Faellen von Wirbelsaehlen Tuberkulose). *Muenchen. med. Wchnschr.*, 1920, lxvii, 896.

The cases reported in this article were operated on between 1913 and 1918. Most of the patients were children. In every instance the graft implanted into the spine was taken from the tibia. The patient was then kept in bed for three months, usually in a cast. This treatment was supplemented by fresh air, sun baths, and salt baths. A supporting corset was worn for six months longer.

Contra-indications to the operation were fistulae and infection of the involved area and a poor general condition. The operation was postponed also in cases of paralysis, a plaster cast, extension, and laminectomy being tried first. Abscesses and fistulae were treated with Calot injections. These quickly stopped the pain. The graft usually healed into place firmly and permanently fixed the spine in the position in which it was placed at operation. Cases of fistula are less favorable but in some of them the fistulae healed permanently. Poor results (paralysis, suppuration) were rare.

Of 49 cases of tuberculosis of the spine 42 were benefited and 26 may be regarded as cured permanently. Of these, 21 were operated on over three years ago.

When the spine is straight normally, gibbus formation is prevented by the operation, and when a gibbus is already present it is prevented from becoming worse. Mobility of the spine is increased. Children are enabled to exercise again and adults to earn their living.

GRASHEY (Z).

**Forbes, A. M.: The Technique of an Operation for Spinal Fusion as Practiced in Montreal.** *J. Orthop. Surg.*, 1920, ii, 509.

In selected cases of tuberculosis of the spine and scoliosis Forbes has used an operation which he believes gives a stronger band of bone fusion and is preferable to other methods when a large number of vertebrae are to be ankylosed and when leverage is a possible source of weakness. He believes that the Hibbs operation is more exact and mechanically perfect than the Albee procedure. The operation described by Forbes differs from that of Hibbs in that the spinous processes are split vertically in sections and these are wedged and interdigitated with each other and the cortical plates taken from the laminae so as to aid in bridging between the laminae and the spinal process.

Because of the wider separation in the lumbar area, the laminae of the lumbar vertebrae are gauged with a chisel so that the cortical areas are separated from the medullary areas and pried up along the superior and inferior surfaces of these parts of



the vertebræ. When the entire dorsolumbar spine is to be fused, the operation is done in two stages, the lumbar portion being operated upon first and the dorsal portion from three to six months later. A plaster of Paris cast is then applied with the patient in the prone position and is not removed until after a period of six months.

H. W. MEYERDING.

**Baker, R. H.: Compression Fracture of the Vertebral Bodies with Delayed Symptoms (Kummel's Disease); with a Report of Seven Cases.** *Surg., Gynec. & Obst.*, 1920, xxxi, 359.

A series of cases of spinal injury is described in which, shortly after the accident, the spinal symptoms subside rather promptly only to return after

several months in an aggravated form with pain, compression of the vertebral bodies, kyphos, rigidity, etc.

There is doubt in the author's mind as to whether the severity of the lesion was not realized at the early examination or, because of poor technique, the pathology was not made apparent in the X-ray examination. Careful radiographic and clinical examinations are essential in all cases of spinal trauma. Negative findings are not positive proof of the absence of a compression fracture.

The X-ray examinations should be repeated. The prognosis depends entirely upon an early diagnosis and prompt immobilization.

LISTER TUHOLSKE.

## SURGERY OF THE NERVOUS SYSTEM

**Harris, R. I.: An Operation for the Relief of Median Anæsthesia.** *J. Orthop. Surg.*, 1920, ii, 519.

In certain cases of nerve injury it is difficult or impossible to suture the nerve because of the size of the gap between the severed ends. In such cases the outlook as to the recovery of nerve function is nearly hopeless. In certain types of nerve injuries, however, secondary operations to overcome the paralysis by tendon transplantation have given splendid results. The author reports the following case:

The patient had received a recent bullet wound of the forearm, the missile having penetrated from front to back severing the median nerve and fracturing the ulna. The result was non-union of the ulna and a loss of about an inch of the shaft. Examination of the median nerve showed all the signs of complete section below the level of the fibers to the flexors of the forearm. These retained their voluntary power and responded to faradic stimulation. The opponens pollicis was found to be completely paralyzed.

An interesting anomaly of innervation was noted. The superficial head of the flexor pollicis brevis received its nerve supply from the ulnar nerve instead of the median nerve. This muscle had voluntary power, responded to faradism, and contracted when the ulnar nerve was stimulated by faradism at the elbow. Because of its insertion into the outer sesamoid bone at the metacarpophalangeal joint of the thumb the patient was able to oppose the thumb to the fingers in spite of the paralysis of the pollicis. The median area was completely anæsthetic. Tropic and vasomotor changes were very marked.

In this case it was decided to implant the radial nerve into the lower median segment in the hope that the fibrils of this purely sensory branch of the musculospiral nerve would grow down the neurilemma sheaths of the median nerve and find new end-organs in the skin of the median area. The anastomosis was performed as follows:

The radial nerve between the tendons of the supinator longus and the extensor carpi radialis longus was exposed by a linear incision on the dorsal surface of the lower end of the radius and the nerve cut off at the level of the base of the metacarpal bone of the thumb. Through a second incision on the anterior surface of the wrist the lower segment of the median nerve was exposed and freed, and its end cut back until fresh fibers appeared. With a Mayo scissors a tunnel was then bored through the subcutaneous fat from the upper end of the dorsal incision to the lower end of the anterior incision. Through this tunnel the radial nerve was passed. The prepared ends of the radial and median nerves were thus brought into apposition for end-to-end suture. The suturing was done with interrupted perineural sutures of fine catgut and the site of suturing was covered with a section of vein which had been slipped along the radial nerve previously.

Of all injuries of peripheral nerves, section of the median nerve is probably the worst as the paralysis and anæsthesia involve the fingers which are most used. Even if the injury is below the level of the fibers in the forearm, as in the case reported, there are two decided disabilities, anæsthesia of the palmar surface of the thumb, the index finger, the middle finger, and the radial half of the hand, and paralysis of the opponens pollicis with consequent inability to oppose the thumb to the fingers.

In conclusion the author states that the operation described in this article appears to alleviate the anæsthesia of the palmar surface of the thumb, the index finger, and the middle finger and that if it is successful in restoring sensation only to a degree sufficient to prevent unconscious burns and frost-bites it is of considerable value. The approach to normal in the case reported leads to the belief that a very considerable restoration of function is possible. The end-result after the operation will be best in low injuries of the median nerve as in such cases flexion of the fingers has not been lost.

L. C. IONNELLY.



**Coleman, C. C.: The Interpretation of Muscle Function in Its Relation to Injuries of the Peripheral Nerves.** *Surg., Gynec. & Obst.*, 1920, xxxi, 246.

The author's study of motor impairment following peripheral nerve injuries is based on observations made during a service of seven months in the division of neurosurgery of the Cape May and Fox Hills Army Hospitals. A few observations made in private cases of nerve lesions are included to emphasize certain phases of the subject not recorded in the data collected in the reconstruction hospitals. All of the patients had received wounds at least several months before coming under observation, and were studied under conditions highly favorable to the investigation of muscle function.

The cycle of disturbed motor function ranging from great enfeeblement or almost complete paralysis to practically complete return of muscle power was noted in many cases during the period of observation.

The disability following a nerve injury is estimated chiefly in terms of voluntary movement, the trophic and sensory loss being of much less consequence than the motor impairment. The determination of the exact amount and distribution of impairment of function of muscle groups is of great practical importance in the study of patients with nerve lesions. Recovery of muscle function is the most important evidence of regeneration of the paralyzed nerve from the standpoint of diagnosis and treatment. Accurate interpretation of voluntary movement often requires careful and repeated examinations of the affected muscles. Associated injuries of bones, blood vessels, muscle bellies, and tendons confuse the clinical investigation. In cases of combined injury of two or more structures, much study is necessary to dissociate the lesions and determine the share of each in the limitation or loss of voluntary movement. Functional conditions engrafted on injuries which may be slight or severe often cloud the picture.

Muscle function as affected primarily by the nerve injury is analyzed. The unexpected appearance of voluntary movement in segments of the limb supplied by the injured nerve makes the interpretation of muscle function difficult and imposes the necessity for precaution in making a decision regarding the integrity of the nerve in question. Movements normally executed by the paralyzed muscles of the first order may be accurately taken up by subsidiary muscles with a different nerve supply. The action of these subsidiary muscles may appear only after paralysis of the muscle primarily responsible for the movement, and under such circumstances the motor function of the normal neuromuscular mechanism may be closely imitated. Substitutionary movements or the "supplementary motility" of Letievant have been carefully studied in the recent war. Practically all of the common substitutions were noted and most of them observed repeatedly in the patients studied.

The majority of substitutionary movements are found in the upper extremity, particularly in the hand. Here the convergence of all the larger motor nerves of the brachial plexus, with the action of each sometimes re-inforcing and again overlapping that of the others, may produce deceptive motor phenomena when one or more of the nerves are injured. Beginning at the shoulder, the author discusses the motor functions of the various segments of the upper extremity consecutively. A case reported with a photograph shows elevation of the arm by the substitutionary action of the supraspinatus for the paralyzed deltoid. This case is of interest because, according to Tinel, substitutionary movements are ineffective in deltoid paralysis.

The function of the brachioradialis as a flexor of the forearm and its limited action as a supinator are both emphasized. The substitution of the pronator action in paralysis of the normal flexors of the forearm is demonstrated by a case report. Substitutionary muscle action for normal movements of the forearm and wrist is described and analyzed.

Increase of a drop-wrist due to musculospiral paralysis by forcible flexion of the fingers, as in making a fist, is a frequent observation when the hand has been supported by a splint or the extensor tendons are shortened from any cause. Elongation of the extensor tendons due to hypotonia prevents this compensatory movement which is purely mechanical.

The study of the function of the intrinsic hand muscles is of great importance, especially in low lesions of the median and ulnar nerves. The musculospiral nerve does not supply any of the intrinsic muscles of the hand, but controls and perfects their function. Moreover, the long extensors of the thumb and fingers are capable of compensating for the loss of power in the interossei which produce lateral movements of the fingers and extend the distal phalanges.

The loss of function of the ulnar intrinsic hand muscles can be compensated in nearly all instances although the refinement of finger motility is generally impaired. A practical test of ulnar function is the ability to superimpose the extended little finger upon the palmar surface of the ring finger.

While admitting that there are anomalies in the nerve supply to the muscles of the hand, the author believes that all the interossei, including the adductor of the thumb, are supplied by the ulnar. The median supply of the intrinsic hand muscles is limited normally to the two outer lumbricales and the intrinsic muscles of the thumb, with the exception of the adductor pollicis. Ability to pick up a small object or to bring the pulp of the thumb into contact with that of the fingers at the level of the last phalangeal articulation indicates normal action of the intrinsic thumb muscles in the median distribution.

Comparatively few substitutionary movements were observed in the lower extremity. Flexion of



the knee is nearly always preserved in sciatic lesions owing to the fact that the branches to the semitendinosus which leave the sciatic trunk at a high level escape injury. No patient with inability to flex the knee arising from sciatic paralysis was operated upon by the author.

Paralysis of the anterior crural was extremely rare in the series of cases studied. Consequently the investigation of extension of the leg was not often required. A patient with anterior crural paralysis who is under observation at the present time is able to maintain extension at the knee by the action of the tensor fasciæ femoris supplied by the superior gluteal. The gait is characteristic and the usual secondary hydrarthrosis is present. Inversion movements of the ankle may be attributed to a paralyzed tibialis anticus unless the foot is held at right angles to the leg to abolish substitution by the tibialis posticus. If the foot is in plantar flexion, the posticus normally contributes to the inversion. Paralysis of the calf muscles may be overlooked when the patient is able to make plantar flexion by substituting the peroneus longus supplied by the external popliteal. The movement is not strong and is accompanied by slight eversion of the foot.

Toe movements are sometimes confusing when the contraction of the antagonists of the paralyzed muscles is followed by a rebound simulating the normal action of the muscles under investigation. If the dorsiflexors of the toes are paralyzed and the patient attempts to contract the paralyzed muscles, plantar flexion of the toes may be the initial movement followed by a rebound of the toes to the original position. The rebound resembles slight dorsiflexion and may be deceptive. The movement desired should take place from the position of rest without a preliminary action of the antagonist. Errors may be avoided by analyzing the components of the movement.

**Forrester-Brown, M. F.: The Results of Operations for Nerve Injury at the Edinburgh War Hospital. *Brit. M. J.*, 1920, ii, 467.**

The author presents an analysis of 643 operations for nerve injury. Three hundred and sixty of the patients were re-examined at periods varying from six months to two years following the operation. Persons who have suffered from nerve injury show considerable variability in the degree of their recovery of motor, sensory, and trophic functions, the recovery not being constant for any particular nerve, for a definite time after operation, or for a certain level of the lesion.

The capacity for work varies with the nature of the lesion. The percentage of patients with injury to an upper limb who are able to work is slightly higher than that of those with injury to a lower limb. Twelve per cent of 237 patients with nerve suture are at ordinary work and 35 per cent at light work. Fifteen per cent of patients with ulnar nerve sutures are engaged in heavy work while 56 per cent of those with median nerve sutures are at light work.

This shows that the anæsthesia of the thumb and index finger is more disabling to skilled workers than the general weakness produced by loss of the ulnar intrinsic muscles. Eight per cent of 187 patients with neurolysis are at ordinary work and 36 per cent at light work. The results in these cases are less satisfactory than might be expected. Of 81 patients with tendon transplants for various lesions in the upper limb, 23 per cent are at ordinary work and 36 per cent at light work, results markedly better than those following nerve suture.

The degree of recovery after nerve suture in 158 cases amounted to 28 per cent complete motor return, 19 per cent complete sensory return, 21 per cent complete trophic return, and 50 per cent incomplete return of all three functions. Total recovery resulted in 5 cases of suture of the median nerve and in 8 cases of suture of the musculospiral nerve. Almost complete recovery resulted in several cases of lesions of the ulnar nerve. In 35 cases of injury of the median nerve there was complete motor recovery in 50 per cent and complete sensory recovery in 28 per cent. In 53 cases of injury to the ulnar nerve complete motor recovery resulted in 17 per cent, complete sensory recovery in 13 per cent, and incomplete recovery of both functions in 68 per cent. Cases of lesions of the musculospiral nerve (23) showed complete motor recovery in 62 per cent and complete sensory recovery in 33 per cent. Three nerve grafts subsequently explored were found embedded in dense scar tissue and failed to respond to direct faradic stimulation.

Of 117 cases of neurolysis, full recovery of the motor function resulted in 43 per cent and full recovery of the sensory function in 19 per cent. All except one-half of 1 per cent showed some improvement and no patient was made worse by the operation. In the author's opinion exploration is advisable in all cases of peripheral nerve injury when steady improvement does not occur spontaneously within a period of one or two months after the healing of the wound.

In 96 cases of tendon transplantation in the upper or lower limbs useful restoration of the lost function resulted in all except 1. In many of these cases the results were excellent. Transplantation for musculospiral paralysis gave practically normal function of the hands. From this fact it is evident that in cases of severe incomplete lesion of the musculospiral nerve and those in which the prognosis after suture is poor, transplantation should be done without hesitation. Following transplantation operations function returns in two or three months, while following nerve suture improvement is not noted for at least two years.

The degree and rate of recovery were not influenced by the length of time between the injury and operation, the duration of the initial sepsis, or recrudescence of sepsis after the nerve operation.

Every patient with a nerve lesion who does not recover spontaneously within a reasonable time



should be subjected to operation as in the majority of cases regeneration of nerve fibers may be looked for although it may be slow. A. C. JOHNSON.

**Thorburn, W.:** On the End-Results of Peripheral Nerve Injuries Treated by Operation. *Lancet*, 1920, cxcix, 640.

The author observes that in cases of secondary suture and nerve grafting done during the war the operations were performed too recently to warrant conclusions as to the end-results.

The regeneration of peripheral nerves is in all cases accomplished by the down-growth of axons from the proximal end into channels or sheaths awaiting them at the peripheral end. The proximal axon is connected with a sensory or motor neurone while the peripheral sheath leads to, or is connected with, a terminal organ, either motor or sensory. It is therefore evident that for repair leading to a good functional result a sufficient number of peripheral sheaths leading in the right direction is necessary in addition to anatomical continuity. Motor axons entering sensory terminal channels are probably lost permanently as are afferent axons which become connected with muscle endings. The union of a purely motor with a purely sensory nerve is followed by no physiological result whatever.

Down-growing axons should enter the channels for which they were originally intended. If the spinal motor cells for the extensor longus pollicis become connected with the peripheral channels for the brachialis anticus lying in the same nerve, physiological confusion results and the spinal cord is unable to produce the movements called for by the brain. It is for this reason that re-education is necessary in the great majority of cases of nerve suture.

Gross shunting or the implantation of one motor nerve into another always gives an imperfect physiological result, even though the anatomical result is perfect. Macroscopic shunting occurs in the vast majority of cases of end-to-end suture and probably always in cases of nerve grafting.

Although the anatomical and physiological result may be perfect, the economic result may be poor because of psychic influences, secondary muscle atrophy, arthritis, or a form of ataxia in which proper movement is possible only under visual control. Fortunately, the economic result is often better than the physiological result.

Vicarious movements may replace those of lost muscles and thereby conceal paralysis; this constitutes a definite source of error in the estimation of neurological results. Secondary suture is very successful in between one-third and two-thirds of all cases, although a perfect neurological recovery is obtained rarely, if ever.

Less favorable results follow nerve grafting. While brilliant achievements are claimed in some cases, it is certain that their number has not been large because of the anatomic-pathologic difficulties which must be overcome.

Operation is more successful when performed on nerves which supply large muscles and especially muscles of homogeneous type, such as the musculospiral, than those the muscular distribution of which is small and complicated, such as the median and ulnar nerves. Purely motor or sensory nerves are more amenable to treatment than nerves with more complicated function. Dual lesions are more serious than single lesions; therefore very little improvement can be expected following a combined injury of the median and ulnar nerves.

The down-growth of axons occurs at the rate of about 1 mm. a day (Tinel's sign). Therefore two hundred days are necessary for a fiber to grow from the wrist to the tip of the index finger and two years for it to grow from the middle of the thigh to the foot. A large part of the time required for recovery appears to be consumed in the linking-up of axons with end organs and in re-education.

In 271 cases of nerve suture, Stopford showed that recovery becomes more perfect the nearer the suture is placed to the spinal cord. This may be due to better nutrition or the fact that surgical operations are performed more easily on thicker trunks.

In the arm, suturing was a failure in 12 per cent of the cases, and in the forearm, in 24 per cent. Secondary suture of the musculospiral nerve gives a good functional result. Following suturing of the median nerve voluntary power in the abductor pollicis brevis returned in only 45 per cent of cases. The results in the ulnar nerve are very disappointing and in the small intrinsic muscles of the hand recovery is exceedingly poor. In many cases, however, injuries to the median and ulnar nerves did not prevent the patient from carrying on his occupation.

The author concludes his article with a reference to the uniformly successful results he has obtained in the treatment of compressed nerves in which type of injury he has had considerable experience.

A. C. JOHNSON.

**Sargent, P.:** Discussion on the End-Results of Injuries to the Peripheral Nerves Treated by Operation. *Brit. M. J.*, 1920, ii, 464.

The two main groups of patients demanding surgical treatment are: (1) those who require restoration of the conductivity of a nerve, and (2) those with functional disability.

End-to-end suture is the only operation which can restore conductivity to a divided nerve; nerve grafting has no practical value. The author does not attempt to distinguish primary and secondary sutures, as regeneration occurs as rapidly and completely following one as the other. Inasmuch as the wounds closed by primary suture had usually been treated early and radically and had healed quickly, the handicap of prolonged suppuration and immobilization was avoided. Better functional results therefore are obtained in these cases.

End-results should be judged by examining the electrical reactions or the power of voluntary contraction in the muscles supplied by the regenerated



nerve, and by testing the various types of sensibility in the area involved. The functional utility of the part also must be included in a summary of the end-results as perfect regeneration without utility of the member supplied is a negative result. Trick movements should be searched for very carefully.

Results of suture in different nerves differ widely. The musculospiral nerve with its relatively simple and elementary function is restored very completely while the results in the ulnar and median nerves which subserve delicate and complex movements are often very different. The execution of these delicate movements requires not only the proper motor impulses, but also the integrity of a complicated sensory mechanism.

The author has never seen a patient in whom restoration of function after suture of the median or the ulnar nerve could be said to approach anywhere near the normal or to attain anything like the degree of perfection so often reached in the case of the musculospiral nerve. Examination of a number of patients observed from two to three years after suture of the median or the ulnar nerve has revealed that the sense of position and the sense of passive movements in the fingers are almost wholly absent, even when there is good evidence of recovery with regard to voluntary movements, electrical reactions, and some other forms of sensibility.

Lack of psychological recovery destroys a good functional result and calls for re-education of the patient.

The majority of "trophic changes" are in reality the direct outcome of neglect or immobilization, whether imposed by splinting or paralysis. Most of these changes can be prevented or relieved by the use of properly directed mechanical and physiotherapeutic treatment.

Disordered vasomotor activity is associated with partial and irritative lesions and is worst in the area of distribution of nerves particularly rich in vasomotor fibers: namely, the median, the ulnar, and the internal popliteal. Disordered vasomotor activity naturally affects the end-results, especially if it has been present for a considerable time before the operation is undertaken. Stiffness of the joints will further impair the ultimate functional results. Resection of the damaged portion of the nerve with end-to-end suture will stop the active trophic changes.

The author believes that operation for causalgia should be encouraged for patients resistant to medical treatment and in cases in which intense suffering prevents physiotherapeutic measures. The injection of alcohol into the nerve often affords immediate relief without injury to the nerve and makes movements and massage possible.

A. C. JOHNSON.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

Paine, A.: *The Origin of Cancer*. *Lancet*, 1920, cxcix, 693.

The origin of cancer should be considered a biological phenomenon and not simply a disorder affecting man. As a result of many years of study of the clinical and pathological manifestations of this disease in man and the lower animals, the author believes that cancer is a form of tissue degeneration dependent on disordered growth of epithelium resulting from injury, either physical or chemical.

The origin of cancerous growth is closely associated with inflammation or the response of tissue to injury. The early stages develop with chronic inflammation. For a study of the relationship of inflammation to cancer the female breast was chosen because of its exposure to external and internal conditions which damage tissue and because it is a common site of the disease. The changes caused by chronic inflammation in the breast are the same as in other organs of the body. If the inflammation is mild or of short duration the changes result in hypertrophy and hyperplasia of the tissue elements, while if it is prolonged and severe the changes are destructive changes with a decrease in the tissue elements.

Paine discusses the relationship of inflammation to the so-called acute and chronic forms of mammary cancer. The cancer cells originate in the destructive stages of chronic inflammation and are preceded by cellular degeneration and a terminal stage of the process. Both in inflammation and cancer the function of the cells is impaired. The author refers to Oertel's theory regarding the two parts of the cell nucleus, one regulating its function and the other its growth. A profound change, physiological or biochemical, has taken place in the cell; it is altered both morphologically and physiologically and in this sense may be considered a different cell.

Bacteria or toxins may be the cause of the chronic inflammation which precedes the malignant change. Other factors, however, must be present in addition as all chronic inflammations do not terminate in malignancy. The occurrence of cancer in later life suggests that age must favor its development. In later life we neither resist nor recover so rapidly and well as in youth and the reactions are more prolonged and chronic. Senility is a relative term and varies with different tissues of the body; there may be also premature senility with corresponding loss of function. Heredity is another factor which may favor cancer. In 100 cases of breast cancer the author found a positive family history in 18. Murray and Slye have reported experimental evidence of the effect of heredity on cancer in mice. Benign



growths stand midway between inflammation and malignancy. The cause of the inflammation may be so attenuated that the process at first ends with the formation of a benign tumor but in later life, because of an increase in its virulence or a decrease in the resistance of the body, the tissue response may extend beyond the limits of inflammation.

MERLE R. HOON.

**Simmons, C. C., and Daland, E. M.: Cancer; Factors Entering into the Delay in Its Surgical Treatment.** *Boston M. & S. J.*, 1920, clxxxiii, 298.

The authors have made observations on 519 cases of carcinoma admitted to the Massachusetts General Hospital during 1917 and 1918.

The average age of the 519 patients was 52.9 years, but varied between 14 and 83.

A family history of cancer was obtained in 11.4 per cent of the cases. This percentage is not large and suggests that heredity as a predisposing factor is of little moment.

The conclusions drawn from this study are given as follows:

1. The symptoms of cancer are dependent on the organ attacked. There are few symptoms characteristic of the disease itself in its early stages.

2. The rapidity of the growth varies within wide limits in the organs attacked.

3. The average duration of the disease in all cases on their admission to the hospital is 12.49 months. The delay before treatment is sought may be divided into:

- a. The delay on the part of the patient after the onset of symptoms, which varies considerably according to the situation of the tumor and the rapidity of its growth, but has little relation to the character of the first symptom. This delay averages 5.4 months.

- b. The delay on the part of the physician before advising operation, which averages 3 months. There is practically no delay on the part of the patient after operation is advised. The advice is accepted and arrangements are usually made for operation at once.

4. In only 44.5 per cent of the cases of cancer admitted to a general hospital is there any hope of cure by a radical operation. The operative mortality in these cases is 15 per cent. The chief causes of death are, in the order named, sepsis, shock, and pneumonia.

M. H. HOBART.

**Watson-Williams, E.: The Treatment of Inoperable Cancer with Selenium.** *Brit. J. Surg.*, 1920, viii, 50.

When Wassermann, in 1911, discovered that the injection of a solution of selenium-eosin produces remarkable changes in the tumors of mice, it appeared that a cure for cancer had been found. The solution could not be given directly to patients, however, because of its intensely poisonous nature. This difficulty has been surmounted by the preparation of a colloidal suspension of selenium.

The colloidal suspension may be given intramuscularly or intravenously but the intravenous route is preferable. Many of the injections have been given to ambulatory patients who were allowed to go home half an hour later. The same vein may be used repeatedly. A reaction is usually noticed in the growth itself, especially when it is in a sensitive organ, such as the tongue or larynx. A general reaction follows with a rise in temperature to 100 or 101 degrees and often headache and malaise. Growths in vascular areas respond best to treatment, and mammary, laryngeal, tonsillar, recurrent, or very rapidly growing tumors not as well. Aged or debilitated patients are not benefited as much as others.

This treatment appears especially suitable for inoperable cancers, and if operative removal has not been as successful as desired, outlying cells may thus be destroyed.

Selenium may act as a protoplasmic poison causing destruction of cells or their nuclei. It is, of course, possible also that the element has merely a germicidal action.

H. H. MINTER.

**Bloodgood, J. C.: Bone Tumors, Benign and Malignant; A Brief Summary of the Salient Features Based on a Study of Some 370 Cases.** *Am. J. Surg.*, 1920, xxxiv, 229.

In the majority of cases of bone tumors two main origins may be recognized in the roentgenogram and the gross specimen—the periosteal and the central (marrow or medullary). While it is true that some lesions, primary in the marrow cavity, may invade the periosteum secondarily, the converse is also true. The division into periosteal and central origins is of great importance from the standpoint of diagnosis and treatment.

True sarcoma of bone, whether periosteal or central, is rarely cured even by amputation. This fact is due to early metastasis to the lung. In periosteal sarcoma the duration of life is usually less than eighteen months. Central sarcoma is a much less frequent lesion than periosteal sarcoma.

The medical profession and public must have their attention constantly called to the fact that delay in the recognition and treatment of all diseases of the bones leads either to death or crippling. The immediate employment of the X-ray for diagnosis is most important. Even after a slight trauma without fracture roentgenography should be a routine procedure.

Concerning what effect early recognition will have on the curability of periosteal and central sarcoma of bone we have, as yet, not sufficient evidence to make any definite conclusions, but it is known that a delay of days or weeks may be associated with metastasis to the lungs.

Although there is evidence that the X-ray, radium, and Coley's serum have a retarding, or even a curative effect on the local growth, we have no evidence of a similar effect on the metastatic growth in the lungs and unless these agents are found



capable of destroying the metastatic nodules in the lung they can add but little to our curative treatment of true sarcoma of bone.

In view of the evidence that few cures are effected by amputation for true sarcoma of bone and the fact that many periosteal and central lesions which may resemble the true sarcoma in the roentgenogram are benign or relatively benign, amputation should never be performed until the diagnosis of malignancy is established. In many cases an exploratory incision will be necessary to establish this diagnosis.

In a few cases of periosteal sarcoma, however, the X-ray picture is so distinctive, that the diagnosis can be made from the X-ray alone and amputation can be done if the lungs show no metastasis. In the author's opinion this is the operation of choice in cases of true periosteal sarcoma of the femur and the upper end of the tibia as resection with bone transplantation rarely makes the limb as serviceable as an artificial limb. While in cases of this kind treatment with Coley's serum, the X-ray, or radium should be considered, the author is led to advise amputation.

In cases of true periosteal sarcoma of the lower portion of the tibia and fibula which is still well localized resection by a wide margin and transplantation of bone is the operation of choice.

In cases of periosteal sarcoma of the upper extremity where local resection and bone transplantation are ruled out because of local growth it is a question whether Coley's serum, the X-ray, or radium should not be tried first as the loss of the arm is so great a mutilation and the probability of cure is so remote. The author has no record of a case in which a true periosteal sarcoma of the upper extremity was cured by amputation.

In cases of central bone lesions amputation should never be performed without an exploratory incision. However, in some cases in which the tumor can be easily removed by resection followed by bone transplantation with the promise that the extremity will be made serviceable the resection may be performed without exploratory incision if bone cyst, tuberculosis, and the giant-cell tumor for which curetting would be the operation of choice can be ruled out.

The facts in the history which are most helpful in the diagnosis are the age of onset, the duration of the symptoms, the symptom of onset, the character of the pain, the exact data as to trauma and fracture in relation to the symptom of onset, and, most important, whether the lesion is single or multiple.

The most important examinations are those made of the involved area, other bones, and the chest by means of the X-ray. The next most important step is the Wassermann blood test, and then the test of the urine for Bence-Jones bodies. The demonstration of the latter favors multiple myeloma, a hopeless disease, or some other multiple lesion of the skeleton.

The palpation of a tumor, especially in its early stages, is not always distinctive. Syphilitic peri-

ostitis cannot be distinguished from periosteal sarcoma by palpation. The palpation of the shell of bone in central lesions is not diagnostic, nor is the partial or complete destruction of the bony shell a positive sign of malignancy.

The age of onset is helpful in the diagnosis of the central lesion but not in that of the periosteal lesion.

In central bone lesions in which the age of onset is 15 years or less the predominant tumor is the benign bone cyst and in a few cases the central giant-cell tumor. No central sarcoma has been observed which had an age of onset before the fifteenth year. Bone cysts predominate up to the twentieth year, but as central sarcoma must also be considered in this period, exploration for diagnosis should be performed at once in the majority of cases. The predominant age of onset of the giant-cell tumor is from 20 to 35. Bone cysts are very rare after the age of 20. The giant-cell tumor has been observed from the age of 2 to the age of 70; the central sarcoma from 16 to 70; the rare myxoma from 5 to 70; and the still more rare central chondroma from 20 to 50.

The two most common types of periosteal lesion—the benign exostosis and the true and very malignant periosteal sarcoma—have been observed at all ages from 5 to 70.

Among central tumors the bone cyst has come under observation most quickly after the symptom of onset. This is due to the fact that the first symptom is a pathologic fracture. If the symptoms have been present more than one year and there is no evidence of metastasis in the lungs, central sarcoma will rarely be observed.

In cases of periosteal sarcoma death usually results in eighteen months after the symptom of onset. For this reason, if the periosteal lesion has been present more than one year and the X-ray shows no metastasis to the lungs, the evidence is rather against a malignant tumor.

While the symptom of onset in cases of benign bone cysts is usually a pathologic fracture, this has never been observed as the symptom of onset of the central giant-cell tumor or the central sarcoma or the periosteal sarcoma. The predominant symptom of onset in all bone lesions is localized pain. Pain is rarely absent in the periosteal sarcoma. Swelling is more frequently a symptom of onset in periosteal sarcoma than in central sarcoma.

The most predominant etiological factor in both periosteal and central lesions is trauma, but as we have few, if any, X-ray studies of the bone previous to trauma or immediately after it, the possibility that the lesion was present before the injury cannot be excluded.

The evidence is rather against trauma as an etiological factor in bone cysts, osteitis fibrosa, chondroma, and myxoma. In periosteal sarcoma, the central giant-cell tumor, and sarcoma, however, trauma as an etiological factor is very suggestive. Pathological fracture occurring in a patient under 20 is evidence in favor of bone cyst but when it



occurs in a patient over 20 it suggests a central sarcoma of the more malignant type.

The X-ray has shown complete healing of a fracture when the central lesion was a bone cyst but not when it was one of the other types of neoplastic central lesions.

**Johnston, C. H.: The Diagnosis of Hyperthyroidism.** *J. Michigan State M. Soc.*, 1920, xix, 456.

The presence of tachycardia, thyroid enlargement, fine tremor of the hands, eye signs such as a staring expression, lagging lids, and poor convergence associated with an increase in systolic blood pressure justify a diagnosis of toxic goiter or hyperthyroidism. Shortness of breath and a general feeling of exhaustion on exercise, precordial pain, a tendency to perspire, hot flushes of the face and hands, which symptoms are exaggerated by physical strain and excitement, may be found in cases of neuro-circulatory asthenia.

Two recently proposed tests are now being widely used: the determination of the basal metabolism and the adrenalin test.

In several diseases the production of heat is greatly increased without a corresponding increase in the temperature of the body. By far the greatest increase occurs in Graves disease, in which at times it amounts to 100 per cent above normal. This has been found to be so constant that the determination of the basal metabolism is an important index of toxicity in hyperthyroidism and a reliable and accurate method of differentiating this condition. A low or normal metabolic level, however, does not necessarily exclude Graves disease.

Means divides cases of hyperthyroidism into two groups. First, those with extreme tachycardia and a moderate metabolic level, and second, those with moderate tachycardia and extreme metabolic elevation. Patients belonging to Group 1 are benefited equally well by X-ray or surgical treatment alone and surgery preceded by X-ray therapy. In cases in Group 2, X-ray therapy alone may cure, but when the condition is severe must be followed by operation. Surgery alone gives poor results.

The adrenalin test for hyperthyroidism has been largely worked out by Goetsch. An injection of  $\frac{1}{2}$  c. cm. of 1:1,000 solution of adrenalin is made into the deltoid muscle. A positive reaction consists in a rise in the systolic blood pressure or of the pulse rate amounting to ten or fifteen points, associated with rather typical symptoms such as flushing, sweating, increased vascular pulsation, increased tremor of the hands and often of the arms, restlessness, and more or less marked general nervousness. In marked cases the blood pressure may rise thirty or forty points. The tendency of the pulse is to follow the systolic pressure. The diastolic pressure drops. Respiration usually increases in depth but not in rate. A moderate rise in the blood pressure or pulse rate alone without a characteristic increase in symptoms is not regarded as constituting a positive reaction.

M. H. KAHN.

**Montgomery, D. W., and Culver, G. D.: The Treatment of Vascular Nævi with Radium.** *Boston M. & S. J.*, 1920, clxxxiii, 412.

Vascular nævi cease enlarging and shrink almost to normal under radium therapy. Telangiectasis is practically always the result of improper technique and usually occurs where burns have been caused by the radium.

The reports of several cases of vascular nævi treated with radium are given:

Case 1. A boggy nævus about  $1\frac{1}{2}$  cm. in diameter situated on the inner surface of the upper arm. Five applications were given over a period of eighteen months. Each treatment consisted of the application of 75 mgm. of radium screened with  $\frac{1}{2}$  mm. of silver and 1 mm. of brass for three and one-half hours. The results were excellent except that telangiectasis followed a slight burn. This was due probably to the fact that the screening used was not sufficient.

Case 2. The patient was a female infant 10 months old. The lesion first appeared, when the child was about 2 weeks old, in the form of a small pink spot which gradually increased in size until at the time of observation it was 3 cm. in diameter and 7 mm. in height. As the center of the lesion had broken down and healed previously, considerable cicatricial tissue was present at the time treatment was begun. Treatment in this case consisted of the application of a 25 mgm. plaque screened with  $1\frac{1}{2}$  mm. of lead, 2 mm. of wood, and 1 thickness of adhesive plaster. On each side of this plaque a 25 mgm. tube was placed, screened with .5 mm. of silver, 1 mm. of brass, 1 mm. of lead, 2 mm. of wood, and 1 thickness of adhesive plaster. This was kept in place for five hours. After six weeks the treatment was repeated, except that only .4 mm. of lead was used. After two months the tumor was so reduced that only one 25 mgm. tube was necessary to cover the lesion. This was used with the same screening for a period of five hours. After four months another treatment was given although the lesion had practically disappeared.

Case 3. The patient was a baby 18 months old with a large bulbous nævus covering the whole tip of the nose. Such cases usually respond well to the action of radium rays, but because of their nature, the skin will never resume its normal texture. In this instance the treatment consisted of the use of a 25 mgm. plaque of radium screened with 2 mm. of lead, 2 mm. of wood, 12 thicknesses of gauze, and 1 thickness of zinc-oxide adhesive plaster which was applied for two and one-half hours. After six weeks a similar application was given except that the lead screening was reduced to 1 mm. After another six weeks the same plaque was used for five hours, but screened with 1.2 mm. of brass, 2 mm. of wood, 4 thicknesses of gauze, and 1 thickness of zinc-oxide adhesive plaster. Two and one-half months later the last treatment was repeated. The heavy screening used in this case was to prevent burning. No signs of a burn appeared following the application.



The long interval between treatments was to allow complete shrinkage of the vessels following each treatment. Further treatments will be given if there is any reason to believe that more nœvus tissue is present.

Following these case reports the authors discuss screening. They state that it is better to err on the side of too much screening rather than too little. This is true especially when the cosmetic effect must be taken into consideration. Attention is drawn to the fact that there is a difference between screening and shielding. The shield is usually a metal used to protect the surrounding healthy tissue while the purpose of the screen is to keep certain rays from acting on the tissues.

The authors' favorite plaque was a plaque about the size of a 10-cent piece containing approximately 25 mgm. of radium.

The spider nœvus is not at all amenable to radium treatment as it does not contain any nœvus tissue or hyperplastic nœvus blood vessels which may be acted upon by the gamma rays. For the removal of the central point and the radiating capillaries the electrolytic needle may be used.

W. L. BROWN.

#### SERA, VACCINES, AND FERMENTS

**Stracker, O.: Parenteral Injection of Albumin as Palliative Treatment in Latent Infection** (Parenterale Eiweisseinverleibungen als Versuch einer Palliativbehandlung bei latenter Infektion). *Med. Klin.*, 1920, xvi, 388.

Stracker reports regarding experiments with injections of milk into amputation stumps for the purpose of influencing favorably latent infection following secondary corrective operations.

At intervals of one day injections of 10 c. cm. of sterilized milk were given three times into the gluteal muscles. In general, the cases treated in this manner ran a more favorable course than those not so treated. Profuse suppuration was entirely absent and the healing of wounds closing by second intention was considerably shortened. Stracker interprets the favorable action as follows:

"Antibodies seem to be increased. In those cases in which the number of organisms around the operative field are very numerous and the body has not the resistance necessary to prevent the formation of pus the artificial aid seems to prevent suppuration. In others, in which a milder infection has led to secondary healing, the injection causes a primary healing."

The author attempts to bring his theory of the action of milk therapy into agreement with the other theories of immunity—protoplasm activation, hyperæmia with permeability of the blood-vessel walls, fever and increased leucocyte activity. He believes that the injection of milk may be considered as strengthening the defenses of the body against bacterial activity (agglutinins, antitoxins, bacteriolysins, opsonins, and precipitins). NAEGELI (Z).

#### BLOOD

**Love, G. R.: An Accurate and Simple Method of Testing the Coagulation Time of Blood.** *Med. Rec.*, 1920, xcvi, 436.

The author states that the ordinary methods of testing the coagulation time are inaccurate. The average time necessary for the coagulation of blood has been found to be 10½ minutes with a variation from 8 to 15 minutes.

Love has devised a method whereby the clotting time can be ascertained accurately within 20 seconds. Five 1-in. lengths of 5-mm. glass tubing are heated over a flame and drawn out until the middle 2 in. are from 30 to 34 in. in length with a diameter between 0.3 and 0.5 mm.

Blood is collected in a paraffin test tube by venous puncture and drawn by suction into the capillary tubes. These tubes are then broken carefully at short intervals, beginning within two minutes of the supposed coagulation time. The broken pieces are carefully drawn apart. The end point comes when a thread of fibrin will stretch from 7 to 10 mm. across the break. The temperature must be recorded as it has a definite effect upon the coagulation time.

This test was done on 26 healthy dogs and the results were plotted in a chart. The curve shows that the coagulation of blood follows the law for ordinary chemicals, an increase of 10 degrees doubling the rate of the reaction. M. H. HOBART.

**Sanford, A. H.: Preparation of Amboceptor with Human Erythrocytes.** *Am. J. Syphilis*, 1920, iv, 697.

Sanford describes a modified method used at the Mayo Clinic in the preparation of amboceptor with human erythrocytes. A dog rather than a rabbit is immunized with washed human red blood cells. This has proved very satisfactory because the amount of agglutinin which develops in dog serum for human erythrocytes is slight. A dog about the size of a fox terrier is preferred.

Human blood obtained from a patient is placed in a 250 c. cm. flask containing 50 c. cm. of a 2 per cent sterile solution of sodium citrate. The cells are washed five or six times with normal salt solution by repeated centrifugalizations and a 50 per cent suspension is then made in normal salt solution. The injections are given intraperitoneally. The initial injection for a small dog varies from 30 to 35 c. cm. The second week 40 c. cm. are given, and the third week 50 c. cm.

Seven days after the third injection 2 or 3 c. cm. of blood are aspirated from the animal's heart and titrated for amboceptor, a double unit of complement being used. Occasionally a good hæmolytic has developed in this short time. As a rule, however, it is necessary to give another injection of from 50 to 60 c. cm., and in some instances even a fifth injection. All injections are given at intervals of from seven to ten days.



When an amboceptor of good titer has been obtained the animal is bled with a 20-, 30-, or 50-c. cm. all-glass syringe and the blood is centrifugalized at once in sterile 50 c. cm. centrifuge tubes. A clear clot results in the upper portion of the tube. This is separated and again centrifugalized for several minutes. The following day the serum is removed, inactivated for thirty or forty minutes at 56 degrees centigrade, and titrated for amboceptor content. The titer amboceptor produced by the dog is not as high as that produced by the rabbit, being usually 1:500. It is used to better advantage, however, in the addition of amboceptor in mass to a given quantity of washed cells as there is no interference from agglutinins.

H. H. MINIER.

**Black, J. H., Fowler, K., and Pierce, P.: The Development of the Bactericidal Power of Whole Blood and Antibodies in Serum. *J. Am. M. Ass.*, 1920, lxxv, 915.**

In connection with a new technique for determining the bactericidal action of whole blood described in the *Journal of Immunology* for July, 1918, Heist and the Solis-Cohens advance the hypothesis that the "number of organisms destroyed by the blood is, to a certain extent, proportional to the natural immunity \* \* \* to the organism. This likewise appears to be true of the immunity induced by inoculation."

The work reported here was undertaken primarily to determine: "(1) whether this method would prove serviceable in demonstrating the progress of the development of an artificially induced immunity; (2) whether any recognizable relationship may exist between the bactericidal titer of the whole blood and the antibodies of the serum; and (3) whether any information may be obtained by this method as to the mechanism of the bactericidal action."

The typhoid bacillus was selected for this work. Rabbits were used for the experiments because of their availability and because they are able to furnish sufficient blood for all tests. The conclusions reached were as follows:

1. "The bactericidal power of blood as determined by the method of Heist and the Solis-Cohens is the most dependable criterion of the actual immunity of the animal.

2. "The development of the bactericidal power of the blood against typhoid and Shiga bacilli was practically identical with that of the serum.

3. "The route of inoculation made no material difference in the rapidity or height of the development of bactericidal power.

4. "The agglutinins and complement fixing bodies were only roughly comparable to the bactericidal power.

5. "The leucocyte counts and phagocytic index were of no value in determining the degree of immunity.

6. "In the rabbit immunized to typhoid and dysentery bacilli, lysis occurs with great rapidity and a short incubation period is sufficient.

7. "No evidence could be secured as to the mechanism of lysis. Phagocytosis, in all probability, was not a factor.

8. "Citratizing and defibrinating blood of rabbits immunized to typhoid and dysentery bacilli did not affect the bactericidal activity save to slow the reaction.

9. "In the blood of typhoid and dysentery immune animals, contaminating organisms may grow luxuriantly. A short incubation period removes most of the difficulty due to contaminants.

10. "The refractory state of Teague and McWilliams is shown to depend probably on a rapid rise in bactericidal power, and the rapidity of mobilization of this power varies with the route of injection.

11. "Inactivation of serum of immunized rabbits did not materially reduce the bactericidal action."

I. W. BACH.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Todd, T. W.: The Rôle of Cancellous Tissue in Healing Bone. *Ann. Surg.*, 1920, lxxii, 452.**

Todd's conclusions are based upon his experience with cases of chronic osteomyelitis at the Base Hospital of Wolsley Barracks, London, Ontario. All of these cases were the result of compound and more or less comminuted fractures of bones of the limbs.

From time to time radiograms were made, and in some cases portions were removed from the healing walls under local anæsthesia for histologic examination in order that the regeneration process and rate might be adequately checked up. In the typical healing of a bone cavity it was found that the regeneration occurred from the cancellous tissue. The advance of ossification cannot be adequately followed by means of radiographic examination.

Cut edges of compact bone tissue limiting the bone opening invariably showed little or no tendency to produce new bone.

The fact that the cancellous tissue is a generous source of osteoblasts has not been sufficiently recognized. It is in the bone abscesses which are "thoroughly" curetted out so that only the compact shell remains that the results are so disastrous from the point of view of healing. This is true especially in those cases in which the destructive work of the curette is supplemented by swabbing with pure carbolic acid.

The effect of slight pressure in retarding and frequently inhibiting bone growth cannot be too strongly emphasized. Some means of keeping the wound wide open is necessary. For this purpose Todd devised a method in which dental impression wax is used with the Smith glass tube procedure.

It cannot be known definitely whether flaking has ceased until six months after the operation. Therefore the soft tissue must be prevented from falling in for that length of time. Ossification will not penetrate fibrosis in recent granulations.



Granulations change to a gray color when they become fibrous and should then be removed under local anæsthesia.

Filling of the cavity may be allowed to occur only after it is reasonably certain that sequestra resulting from the mechanical damage of the operation have separated.

Gauze packing is removed at the first dressing between twenty-four and forty-eight hours after operation. As a rule Sollman's self-induction of analgesia by inhalation of chloroform was used at the first dressing.

The effect of inefficient drainage may be localized to the healing walls of the cavity, but is usually more widely distributed in the bone. When practical, ambulatory treatment is the method of choice.

In the lower end of the tibia it was found necessary in every case to open through the subcutaneous surface and establish through-and-through drainage.

The article is summarized as follows:

1. Cancellous tissue is one of the chief agents in the regeneration of bone, and like the cambium layer of periosteum, should be treated at operation in the most conservative manner consistent with thorough exploration and drainage.

2. In regeneration the cancellous tissue nearest the mid-length of the bone grows most rapidly, whereas that in or near the articular extremities shows less readiness to proliferate and fill the cavity.

3. Septic bone cavities should be permitted to heal from the bottom, the wound in the soft tissues being kept wide open until this has occurred. Disturbance of the cancellous tissue should be reduced to the minimum and no "disinfection" of the cavity should be attempted for this will kill the remaining tissue from which regeneration is to be expected.

4. Regenerating bone is very sensitive to pressure, even that of soft tissues and that due to inefficient drainage. It is not adversely affected by the ambulatory method of treatment.

5. Compact bone plays a very minor part in regeneration.

C. R. STEINKE.

MacLeod, J. J. R., Self, A. R., and Taylor, N. B.: The Effects of Hot and Cold Applications on the Superficial and Deep Temperatures. *Lancet*, 1920, cxcix, 645.

The authors used rabbits in their carefully controlled experiments. It was found that normal temperatures were not affected by the local application of heat at a point distant from the thermometer.

In taking the temperature intramuscularly below the sites at which the heat was applied, it was found that the penetration averaged more than 20 mm. When the heat was applied over the abdomen, no change in the rectal temperature occurred, but below this point on the inside of the abdomen the temperature was increased 4 degrees centigrade and the amount of increase ranged inversely with the distance from the point at which the heat was applied.

In the experiments with cold the temperature curve moved in the opposite direction and the findings were as distinct as those in the experiments with heat.

J. A. BUCHANAN.

## EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

Auer, J.: Local Auto-Inoculation of the Sensitized Organism with Foreign Protein as a Cause of Abnormal Reactions. *J. Exper. M.*, 1920, xxxii, 427.

While testing the sensitiveness of a number of dogs which had been treated with horse serum some years previously, employing heavy doses of horse serum for the re-injections, the author observed that a peculiar œdema developed at the site of the operative wound in the inguinal region. This was noted about two days after the test and formed a fairly extensive, thick, brawny mass of tissue. There was no discharge from the wound. In order to explain this peculiar type of œdema Auer assumed that the local reaction was anaphylactic and produced in the following fashion:

A foreign protein (horse serum) having entered the circulation because of the re-injection, it is probable that a certain amount of this protein would pass into the tissues adjoining the wound during the development of the ordinary wound œdema following the operation. The amount of foreign protein acting locally was increased by the oozing of blood, serum, plasma, and lymph into the wound from the severed blood and lymphatic capillary channels, all of which contained the antigen. As the dogs were sensitized to this foreign protein, the skin and adjoining tissues were also sensitized and responded by an anaphylactic reaction to this local auto-inoculation of horse serum.

To determine whether this working hypothesis of local auto-inoculation, which was new to him, would explain functional changes in any tissue capable of reacting anaphylactically, and to test its validity, Auer carried out further experiments. His findings and conclusions are summarized as follows:

The skin irritant, xylol, applied to the ears of sensitized and re-injected rabbits often caused a severe inflammation with the formation of crusts and destruction of tissue. Dry gangrene of the entire ear tip resulted.

The same agent applied in the same dosage and in the same way to the ears of normal rabbits, normal rabbits injected once with horse serum (serum controls), or rabbits which had been sensitized but not re-injected, caused only a mild inflammation with more or less œdema. The inflammation and œdema disappeared in two or three days.

The ear lesions of the sensitized re-injected rabbits which developed after the application of xylol were interpreted as a primary anaphylactic reaction. This primary anaphylactic reaction was considered the result of a local auto-inoculation of the ear tissues with circulating antigen. The local auto-



inoculation was brought about by the irritant action of the xylol which caused an inflammation and oedema at the site of application. An anaphylactic reaction occurred because the inflamed tissues were more active metabolically than normal tissues and therefore the inflamed cells were affected by more antigen per unit of time than the normal cells. A subliminal concentration of antigen for non-inflamed, sensitized cells thus became effective where inflamed sensitized cells were concerned.

Theoretically this process may occur in any tissue of a sensitized animal which can show an anaphylactic reaction, such, for example, as the intestines, lungs, heart, skin, nerves, arteries, etc. It is possible also that this interplay of conditions might explain a number of functional abnormalities in the human subject.

G. E. BEILBY.

**Marshall, E. K., Jr.: The Influence of Diuresis on the Elimination of Urea, Creatinine, and Chlorides.** *J. Pharmacol. & Exper. Therap.*, 1920, xvi, 141.

The author studied the effects of the ingestion of large quantities of water—water diuresis—on the elimination of urea, creatinine, and chlorides by normal men and dogs.

The urine volume is frequently increased twenty-fold or more. Creatinine is not increased to a measurable extent. Urea is increased definitely, but never more than two-fold. Chlorides are apparently increased, but the increase is variable and generally less marked than that of urea.

The increase in urea and chlorides does not correspond to the maximum increase in water excretion; in fact, at the height of the diuresis, the chloride elimination generally decreases.

During water diuresis the chlorides of the plasma may decrease, while the concentrations of urea and creatinine in the plasma do not vary appreciably.

SAMUEL KAHN.

**Steinach, E.: Rejuvenation by Means of Experimental Invigoration of the Aging Genital Gland** (Verjuengung durch experimentelle Neubelebung der alternden Pubertaetsdruese). Berlin: Springer, 1920.

In this article, which is illustrated with nine beautiful plates, the author gives the result of his ten years' experiments "in re-invigorating the aging testicle to restore the attributes of youth."

The experiments were performed on the rat. The life of this animal averages between twenty-seven and thirty months and the phenomena of old age appear between the eighteenth and twenty-third month. These phenomena consist of a general decline in strength, emaciation, loss of hair, atrophy of the genitals, and in the male, a decrease in sexual libido and impotence. The author shows the atrophy of the genitals by excellent plates, and the senile atrophy of the testicle, consisting of retrogression of the semen-forming elements and marked disappearance of the Leydig cells, by photomicrographs.

By ligating the spermatic duct between the testicle and the head of the epididymis, Steinach was able to cause a remarkable regeneration of the Leydig cells, and these again formed gland complexes. The spermatic cells underwent complete atrophy whereas the Sertoli cells remained intact. Functionally this regeneration manifested itself in complete retrogression of the phenomena of old age; the appetite returned, the weight increased, the hair grew again and became smooth, the animal became lively, and sexual potency returned, in some cases being even increased. There was complete regeneration also of the other genital organs. This change was brought about even by unilateral ligation. The offspring were normally developed and able to breed.

In addition to experiments in autoplasmic regeneration the author conducted successfully homoplastic experiments in which he implanted a testicle into the abdominal wall. Similar work has been done on man by Lichtenstern.

In females Steinach effected rejuvenation by implanting ovaries into the abdominal wall. The senile females again came to heat, became pregnant, and bore normal offspring which they were able to nurse.

The autoplasmic method was used by Lichtenstern with good results in the treatment of three men. In the cases of women, for whom only the implantation of ovaries is possible, no practical test could be made for obvious reasons. The author hopes to influence the ovaries favorably by proper X-ray treatment and is carrying out experiments with Holzknecht.

JUENGLING (Z).

## ROENTGENOLOGY AND RADIUM THERAPY

**Denis, W., Martin, C. L., and Aldrich, M.: A Study of the Relative Toxic Effects Produced by Regional Radiation.** *Am. J. M. Sc.*, 1920, clx, 555.

This article reports the results of a series of experiments undertaken to determine whether roentgen-ray intoxication is produced more easily and in a more severe form by raying certain parts of the body than when other parts are rayed. The experimental animals were rabbits. In different animals different areas of the body were subjected to the action of the rays, the lower abdomen, upper abdomen, chest, thighs, and lateral anterior and posterior parts of the abdomen. Rays backing up an 8-in. parallel spark gap filtered through  $2\frac{1}{2}$  mm. aluminum were used at an 8-in. skin-anode distance. All of the animals received 200 ma. minutes exposure. Blood examinations were made at intervals before and after treatment to determine the white count, non-protein nitrogen, creatin and creatinin, fat and alkali reserve. The urine also was examined and on some of the animals autopsies were performed.

The results showed that rabbits irradiated over the lower abdomen presented symptoms of intoxication associated with rapid loss of weight and diarrhoea. The blood examination showed a rapid fall in the number of white cells with a subsequent



approach to the initial number. In some of the animals there was an unmistakable increase in the non-protein nitrogen and a fall in the alkali reserve. In one instance a rise in blood fat was noted. The creatinin values remained unchanged. In other animals, however, there was no increase in the non-protein nitrogen or fat and no evidence of acidosis as judged from the standpoint of the alkali reserve. The urine was at all times free from albumin and casts and gave no reaction for acetone. In some of the animals injected areas in the large intestine were found at autopsy which on histologic study showed a complete loss of epithelium and masses of fibrin and leucocytes overlying the denuded submucosa. None of the other viscera showed pathologic changes. Animals rayed over the upper abdomen and laterally over the anterior and posterior parts of the abdomen showed symptoms identical with those noted in animals in which the lower abdomen was exposed. Rabbits rayed over the chest and neck and one animal irradiated over the thighs showed no symptoms of intoxication.

In order to rule out the possibility that the blood changes observed which were indicative of acidosis might be due to undernutrition, control animals were partially starved and examined. No evidence of acidosis was found in these animals.

It was noted that toxic reactions were produced only in the animals in which areas including some portion of the intestine were irradiated, and that the intoxication so produced was always severe. Inasmuch as injury to the intestinal epithelium was not found in all of the animals experimented upon, the authors hesitate to attribute much importance to it; in fact, they are inclined to regard it as the result rather than the cause of the intoxication.

Incidentally the experiments tend to disprove the theories attributing roentgen-ray intoxication to the inhalation of gases produced by the high-tension discharge, "roentgen toxins" in the blood, roentgen-ray nephritis, and changes in the enzymes of the gastro-intestinal canal. The fact that the majority of the rabbits which received heavy exposures over the intestines gave evidence of an acidosis, as shown by a fall in the alkali reserve and a rise in the fat and the inorganic phosphates of the blood suggests that acidosis may be a factor in "treatment sickness" following abdominal irradiation.

ADOLPH HARTUNG.

**Bagg, H. J.: The Response of the Animal Organism to Repeated Injections of an Active Deposit of Radium Emanation; Intravenous Injections in Dogs.** *J. Cancer Research*, 1920, v, 301.

Following intravenous or subcutaneous injections of an "active deposit" of radium emanation, the author found in the case of white rats that pathologic changes had resulted in the liver, kidneys, spleen, bone marrow, etc. As the methods employed in these experiments were being used also in the treatment of certain types of cancer in man, it was decided to run a parallel set of experiments on a

larger animal, the dog, to determine the severity of the physiological reactions. To this end the urine was analyzed each day, before and after the treatments; frequent blood counts and differential counts were made; the temperature and weight reactions were recorded; and the organs removed at autopsy were studied histologically.

The active deposit of radium emanation used consisted of a solution the strength of physiological salt solution made by dissolving common salt upon which radium emanation had been deposited in sterile water. This solution contained all the properties of radium metal itself.

The intravenous injections were effected as follows:

The dog was placed on its back on the animal board and held firmly in position. Its ear, previously shaved, was then warmed by several applications of hot cloths until the veins became prominent, when it was washed with alcohol and, by means of a fine needle and a 2 c. cm. Luer syringe, the activated solution was allowed slowly to enter the general circulation. About 2 c. cm. of solution were injected at each treatment. The syringe was covered with a lead shield to protect the fingers of the operator. Blood samples obtained from the ear were examined. The rectal temperature was taken each day, and at more frequent intervals during the period of treatment. The dog was weighed daily during the time when significant weight changes were noted. Throughout the experiment the injection of the active deposit was not repeated until the examination of the urine showed that the metabolism of the animal had entirely recovered from the previous treatment.

On the basis of the results of the investigation as a whole the author believes that in the intravenous use of the solution form of the active deposit of radium emanation as a therapeutic agent in cancer or other diseases it is necessary to keep in mind the fact that after an initial dose of such radio-active substance the animal organism is permanently altered and will not give the same reaction to a repetition of the initial dose. In the experiments reported the organism was able to compensate for a severe initial dose of the radio-active substance, but after a certain point had been reached the natural protective adaptations on the part of the organs affected became inadequate to meet the demands of the organism as a whole, and the effects of the intoxication were greatly increased.

Large intravenous doses of an active deposit of radium emanation caused a considerable reduction in the number of white blood cells, which, following the initial dose, sometimes amounted to as much as 80 per cent of the total number of erythrocytes. The simultaneous reduction in the number of red blood cells was only about 25 per cent.

Repeated doses, amounting to a total of 338.4 mc. and given in four intravenous injections, apparently produced a very marked decrease in the number of circulating lymphocytes in the blood.



Digestive disturbances, such as severe vomiting and diarrhoea, followed large doses of the radio-active solution and were associated with a considerable reduction in the body weight.

In several cases a rise in body temperature followed the treatments and suggested an adaptive reaction on the part of the organism to meet the toxic condition produced by the relatively sudden destruction of considerable cellular material.

The metabolic changes as determined by the daily urinalysis showed that the larger injections of the radio-active solution were followed by very decided increases in the total nitrogen content of the urine, the urea, creatinine, uric acid, and total phosphates.

Relatively small or moderate doses of the radio-active solution administered after the organism had been injured by a previous injection produced definite changes in the chemical content of the urine indicative of destructive changes within the organism, even when the metabolism was again normal. These injections were sometimes followed by gross symptoms of digestive disturbance.

On histologic study of the organs considerable congestion in the principal viscera was evident. The liver showed a general fatty and granular degeneration; the kidneys, a granular degeneration of the tubule cells; and the spleen, considerable congestion. The splenic pulp was largely drained of cells. The bone marrow was devoid of lymphoid tissue, most of this tissue having been replaced by fat. In one animal there was extreme congestion in the pulp of the lymph nodes associated with a reduction in the size of the lymph follicles. The lungs in one animal were normal, while those of the other, which received the larger dosage of the radio-active solution, were congested and showed slight signs of emphysema. The colon in one animal was markedly congested and showed signs of active mucus production. In the other organs no definite changes were observed.

When the active deposit of radium emanation was given intravenously as a therapeutic agent, great care was necessary to grade the dose according to the patient's general physical condition, which was determined by frequent urine and blood analyses. If more than one dose was given during the treatment, the second dose was made smaller in accordance with the strength of the original dose.

G. E. BEILBY.

#### LEGAL MEDICINE

##### **Hysterical Blindness from Operation Compensable.**

*Weber vs. George Haiss Mfg. Co. et al. (N. Y.), 131 N. Y. Supp., p. 140.*

The claimant suffered an injury to his right eye which made its removal necessary. Simultaneously the sight of the left eye was almost wholly lost. No injury appears to have been done any portion of the left eye. The condition was diagnosed as traumatic neurosis or hysterical blindness. Inasmuch as this was a result of the accidental injury of the right eye, a verdict was rendered in favor of the plaintiff.

J. A. CASTAGNINO.

##### **Accident and Sickness Insurance; "Confinement within the House."** *Bucher vs. Great Eastern Casualty Co. (Mo.) 215 S. W. R., p. 494.*

In a policy of accident and sickness insurance it was provided that certain payments would be made if the insured suffered total disability confining him to his home. The insured became afflicted with a disease known as subacute congestion of the conjunctiva, associated with irritation of the iris and eczema of the eyes and eyelids. In the treatment of this condition exercise in the open air was prescribed. This advice was followed. Therefore, as the insured was not confined to the house, it was decided that he was not entitled to recover under the terms of the policy.

J. A. CASTAGNINO.



## GYNECOLOGY

### UTERUS

**Zaletel, R.: A New Method of Operating on a Prolapsed Uterus: Anterolateral Colpovesicorrhaphy with Colpomyorectorrhaphy** (Nouveau procédé d'opération du prolapsus utérin; colpovésicorrhaphie antéro-latérale avec colpomyorectorrhaphie). *Gynéc. et obst.*, 1920, i, 444.

The method described has given good results in severe cases of uterine prolapse.

A U-shaped incision is made in the anterior vaginal wall and its anterior extremities are joined by a second incision. In this way two small oval openings and a short, wide, central strip are formed in the anterior wall of the vagina. The strip is then separated from the perivesical tissue and lifted as far as Pawlik's triangle. The vesicorrhaphy is done by approximating the lateral surfaces of the bladder longitudinally and, in the Pawlik triangle, suturing in a circle. The median strip is then brought down and fixed by lateral and posterior sutures. This strip must be large enough so that it will not undergo necrosis. In the lateral vesicorrhaphy care must be taken to avoid touching the ureter with the needle.

In the next step the posterior vaginal mass is separated from the perirectal tissues by a slightly curved incision in the vaginorectal fold, which, if necessary, is carried as far as the rectovaginal cul-de-sac. The deep perineal transverse muscle is isolated by sectioning it at the side of the tendinous center in such a way that its two upper layers are left. These layers are then sutured into a more or less solid musculofascial band.

Section of the deep perineum exposes the anal levators which may be followed backward to the ischioanal fossa, and the two levators thus exposed may also be sutured together. At the same time the needle may include the rectal and perirectal tissues. The two deep perineal transverse muscles are then sutured above the plane of union in the levators. A more or less extensive resection of the posterior vaginal wall completes the operation.

The cicatrices being anterolateral, the median strip forms a supple point of support for the bladder. In the posterior colporrhaphy the author re-establishes the two muscular beds which normally constitute the perineal floor by a double row of deep sutures.

W. A. BRENNAN.

**Pfahler, G. F.: The Treatment of Uterine Fibroids and Uterine Hæmorrhage by Means of Radium and X-Rays.** *N. York State J. M.*, 1920, xx, 321.

The roentgen ray and radium are now recognized to be of value in the treatment of uterine hæmorrhage and fibroids. In many of the larger clinics both in this country and Europe radiotherapy is the method of choice. The author at first used the

roentgen ray alone but later employed radium in addition. His results over a period of fourteen years have been most satisfactory.

While in the control of hæmorrhage it is probable that the action of the roentgen ray and radium is exerted chiefly on the ovaries, the author believes that this is not true as regards their action on uterine fibroids. He bases this conclusion on the fact that in many instances uterine fibroids present for a considerable time after the menopause have been made to disappear by radiation and in a case he reported with McGlinn the disappearance of the tumor was brought about without stopping menstruation.

Treatment by radiation is indicated in:

1. All cases of myoma in older women with advanced anæmia which may be the cause of an anæmic heart.
2. The cases of either elderly or young women with marked organic heart disease, diabetes mellitus, chronic nephritis, marked lung disease, or goiter with cardiac symptoms.
3. The cases of patients beyond the fortieth year of age in whom there is no contra-indication.
4. The cases of young women with small tumors not associated with inflammatory disease or hæmorrhage.
5. Cases of uterine hæmorrhage not due to constitutional disturbance.

It should be given serious consideration also in all cases in which the alternative procedure is total hysterectomy.

Contra-indications to treatment by radiation are:

1. All cases of myoma in which the tumor is pedunculated or may be excised without destroying the patient's reproductive powers.
2. Cases of fibroids believed to have undergone malignant degeneration or become gangrenous. In cases of malignancy operation is essential and should be followed by deep roentgentherapy.
3. Cases of fibroids associated with disease of the adnexa.

Special indications for the use of the roentgen rays alone are the cases of unmarried women in which there is some objection to the introduction of radium into the uterine cavity; cases in which a tumor lies in front of, behind, or entirely to one side of the uterus; and cases in which the administration of an anæsthetic is inadvisable.

Indications for the use of radium alone are cases in which there is no contra-indication to the introduction of radium into the uterine cavity and cases of small fibroids associated with severe hæmorrhage.

Radium is a valuable adjunct to roentgentherapy because its rays exert their influence most markedly at the point where the action of the roentgen rays is weakest. The roentgen rays, on the other hand,



exert an influence upon the tumor higher in the abdomen.

The author gives figures showing that in deep radiation radium delivers 2.6 per cent, and the X-rays 12.75 per cent, of the skin dose at a depth of 10 cm. In other words, the proportion of the surface radiation which reaches a depth of 10 cm. is nearly five times as great when the X-ray is used than when radium is employed.

Following radiation, hæmorrhage may cease within a few days but ordinarily the first menstrual period is not much affected. The second period, however, is diminished, and the third practically always absent. The disappearance of a tumor begins after the first month and continues long after the treatment has been stopped. The pressure symptoms associated with the fibroids are relieved, of course, as the tumor mass decreases.

In his roentgen treatments the author uses 5 milliamperes of current with a voltage corresponding to a 9 in. parallel spark gap, or approximately 90,000 volts applied at a focal distance of 10 in. for a period of twelve minutes and filtered through 6 mm. of glass and aluminum. The number of portals of entry is varied according to the size of the tumor but is usually between 2 and 16 on the abdomen and 2 and 4 in the perineal region. Such a course of treatment requires from a day to a week, depending on the size of the tumor and the nature of the disease.

The amount of radium employed varies between 50 and 100 mg., but is usually 50 mg. This is filtered through  $\frac{1}{2}$  mm. of silver, 1 mm. of brass and 1 mm. of rubber, or  $\frac{1}{2}$  mm. of gold and 1 mm. of rubber. First a cleansing douche is given. Tincture of iodine is then applied to the vulva and cervical canal, the uterus is gently dilated, and the radium inserted. The radium is retained in the uterine cavity by means of gauze packing and is left in place from twelve to twenty-four hours except in the cases of young girls when it is desired only to reduce the menstrual flow. In the latter type of case it is not left in place longer than three hours, the application being repeated if necessary. Following the treatment the patient is kept off her feet for twenty-four hours. When there is an intermenstrual flow a preliminary curettage is advisable. Radium treatment does not cause pain but is usually followed by a yellowish discharge lasting for several weeks.

W. L. BROWN.

**Burnam, C. F.: The Radium Treatment of Uterine Cancer.** *N. York State J. M.*, 1920, xx, 316.

At the time the use of radium was first suggested for the treatment of uterine cancer radical hysterectomy, which had been employed for more than ten years, was falling into disrepute because it had been applied to cases already inoperable with the result that the successful results were obscured by many failures. The advent of radium brought a new solution to the problem and immediately extended the range of operability in this condition.

In considering the indications of treatment it is necessary not only to classify uterine cancers as operable and inoperable but also to classify the inoperable growths into a number of subgroups. The necessity for such classification is apparent from the fact that cases with general metastases, involvement of the urinary bladder, parametrial fixation, local regional gland involvement, and recurrent cancers after operation are all grouped together as inoperable, although the indications for treatment and prognosis must vary greatly.

The experience upon which this article is based covers a period of eleven years and represents the joint activities of Kelly, the author, and their associates. Up to one year ago they had treated 700 cases of uterine, cervical, and vaginal carcinomata.

In cases of cancer of the body of the uterus in which there is no fixation and no organic disease hysterectomy is the treatment of choice because radium cannot be used with sufficient precision. There is abundant evidence, however, as to the effectiveness of radium on adenocarcinoma of the uterine body. In a group of such cases in which the patient's general health contra-indicated hysterectomy radium gave not only symptomatic relief but apparent cure continuing over several years. Moreover, a cure obtained with radium was demonstrated on histological examination in several cases in which the uterus was removed later.

When radium is employed in treating operable carcinoma of the body of the uterus the author states that it is given best in a single exposure the equivalent of 4 gram hours of radiation so distributed that every part receives nearly the same treatment. Up to the present time, however, he has not seen a complete cure in a case of large inoperable cancer of this class.

In cancer of the vagina most clinics report operative cures amounting to not much more than 1 or 2 per cent. The author has seen only one operative cure. When the disease is advanced, radium alone should be used. Radium is nearly always beneficial; in 129 cases Burnam observed 15 complete cures, 4 of which lasted for over five years and 1 for nearly nine years. None of the 15 cases was early or operable. When the disease is superficial the arrangement of the apparatus should be such that each square centimeter of surface receives the equivalent of a gram thirty minutes of treatment. In cases of large fixed paravaginal masses this should be supplemented by burying points containing from 2 to 50 millicuries of radium emanation.

Cancers of the cervix are the most common and consequently the most important group under consideration. In addition to the operable and inoperable subgroups Burnam describes a third representing the borderline condition between the two. In this group the parametria are stiffened, the vaginal wall is extensively involved, or there is slight fixation to one side.

Of 200 cases of borderline and inoperable cancers of the cervix treated five years ago, an apparent cure



was obtained in 53. Thirty of the 53 patients are still living and free from the disease. This represents a complete cure of 15 per cent in a group of cancers in which not 1 per cent of cures could be expected from any other method of treatment.

As a whole, the results obtained in cancer of the cervix were as follows:

	Cures Per cent
Radiation alone—operable cases.....	50
Radiation preliminary to operation.....	46
Prophylactic radiation after operation.....	43
Radiation in borderline cases.....	31
Radiation in inoperable cases.....	9
Radiation in recurrent inoperable cases.....	11

While the anatomical structure and position of the cervix permits more intense radiation than is possible in most areas where epitheliomata occur, it has been observed that certain growths are very tolerant to this treatment. In such cases a cure may be obtained readily by extirpation and it is not a far step to assume that the same is true as regards cervical cancers.

The author feels that an endeavor should be made to develop a systematic extirpation of the regional glands in cervical cancer similar to that employed in cancer of the breast, and that in the more advanced cases the treatment of the local lesion should be limited to the use of radium and the removal of glands.

Radium used injudiciously and excessively may produce very grave injuries. Over-radiation causing a burn sets up an endarteritis and limits the power of reproduction of the cells of all the tissues. In from four to ten months this results in the formation of an ulcer which is very painful and closely resembles cancer. An ulcer of this type requires months to heal and is frequently followed by a vesical and rectal fistula.

In conclusion Burnam states that after a clinical cure has been obtained it is not advantageous to remove a uterus which was inoperable previous to radiation. Such a procedure may not be followed by any ill effect but the results have not been as satisfactory as when operation was not performed. This may be due to the fact that cancer cells which remain quiescent for many years may be stirred up by trauma.

W. L. BROWN.

**Recasens, S.: Changes in the Technique of Applying Radium in the Various Forms of Carcinoma of the Cervix** (Veraenderungen in der Applicationstechnik des Radiums in den verschiedenen Formen des Cervixcarcinoms). *Strahlentherapie*, 1920, xi, 189.

This article is based on the author's experience in the treatment of more than 400 cases of carcinoma of the cervix. He is unable to give the percentage of cure as many of the cases have been under observation only a short time. His conclusions are as follows:

Radium therapy is the best treatment for carcinoma of the cervix. The carcinomata with active

proliferation of cells are the most easily influenced. These are the fungous and papillary types. In their treatment the filter thickness may be reduced to 1 mm. or less if the radium capsule is inserted so that it is surrounded by the cancer tissue. The ulcerous forms of carcinoma require larger doses and thicker filters. In the treatment of superficial cancers, those involving the vagina, and the laminated forms plate applicators are preferable to tubes. The infiltrating and nodular forms require especially high dosage and thick filters.

Definite leucopenia is a contra-indication to radium treatment. Leucopenia may be influenced favorably by diathermic treatment of the spleen. The reaction of cancer cells to radium is increased by the intravenous injection of colloidal copper. The author was unable to obtain favorable results with the local use of methylene blue, pyocyanine, eosin, and colloidal metal solutions. Medium doses of radium given at intervals of eight or ten days are better tolerated than massive doses given at greater intervals. The combination of radium and X-ray treatment is to be recommended in every case.

O. MEYER (Z).

**Shaw, W. F.: Wertheim's Hysterectomy for Advanced Carcinoma of the Cervix Made Possible by the Use of Radium.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Obst. & Gynec., 191.

The greatest advance in the treatment of carcinoma of the cervix was the adoption of the radical or Wertheim operation in place of the old-fashioned vaginal or pan-hysterectomy. In a small percentage of cases it is possible to obtain a definite cure with the Wertheim operation. The chief cause of failure is the late stage at which the gynecologist is consulted.

The next great step in the treatment of cervical carcinoma was the use of radium. Radium therapy may render inoperable cases operable. When this treatment is not followed by operation, however, the marked improvement noted usually does not last for more than a year.

Shaw reports 8 cases treated with radium and the Wertheim operation. One of these patients died from the effects of the operation, 2 had recurrences before the end of the second year, and 5 are still without signs of recurrence at periods varying from less than one year to three years after the operation.

The technical difficulties of the operation are greatly increased by the use of radium as the latter replaces the original carcinomatous growth with cartilaginous tissue.

The radium treatments were given by Burrows. Five or more tubes were buried in the cervix and surrounding tissues so that a large dose might be given with minimal local necrosis. The largest possible dose was employed.

Burrows states that uniformly good results cannot be obtained with less than 120 mg. of radium metal or millicuries of emanation for twenty-four hours. With the emanation tubes he uses a screen of pointed



platinum 0.3 mm. in thickness and as a rule places a large silver screened tube in the center of the cervix. While the growth should be cleaned as much as possible before the radium treatment, cauterization or the use of the curette is unnecessary. A daily vaginal douche should be insisted upon for six weeks after treatment in order to prevent vaginal adhesions.

Of 150 cases of carcinoma of the uterine cervix considered hopeless and inoperable, 20 per cent came within the range of surgery after radium treatment.

W. L. BROWN.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

Davis, J. E.: Protective Changes in the Oviduct. *J. Michigan State M. Soc.*, 1920, xix, 429.

Thirty selected specimens of oviducts representing 21 pathologic types were studied. A close correlation of the case histories, operative findings, gross tissue changes, and histologic pathology in different parts of the tube was made to determine the nature of the protective changes against the destruction of tubal function. The pathological conditions included: mixed chronic salpingitis following abortion; late acute salpingitis, mixed infection, following abortion; gonococcic pyosalpingitis, fibro-cystic; slight inflammatory change; tubercular salpingitis; late subacute salpingitis of two years' duration; early chronic salpingitis of three years' duration; tubal pregnancy and salpingitis; chronic salpingitis with calcification and pregnancy; hydrosalpinx; receding chronic gonococcic salpingitis; chronic salpingitis of five years' duration; chronic gonococcic salpingitis with partially inverted fimbriae; double hydrosalpinx with carcinoma of the cervix uteri; chronic salpingitis with calcified appendix; bichloride of mercury poisoning; fallopian tube in a large fibroma of the uterus; chronic gonococcic salpingitis with multiple lumina; oviducts of a child at birth; embryonic foldings in the tube of an adult woman, uterus carcinomatous; and infection of the distal portion of a fallopian tube from the appendix vermiformis by peritoneal contact.

Thirty scale drawings were made of the gross specimens with markings to show the positions of the sections taken for microscopic study. Many interesting changes are shown by photomicrographs and free-hand drawings.

The character of the specific function required of the uterine tubes involves a very efficient protection. The somatic function is always secondary to reproduction, and tubal pathology is a process for the preservation of the open lumen and ostia.

Until puberty, the embryonic tubal folds cause an efficient occlusion. After this period the ostia, controlled by specific muscle arrangement and enervated through ovarian and uterine connections or through the sympathetic connections from mucosa to serosa, may open or close, remain open

or continue partly or wholly closed, whichever best preserves the ultimate function of the organ. The interval constrictions so frequently observed may be imitative of the primary form of protection.

The proximal ostium is only 1 or 2 mm. in diameter with a few simple primary folds which are surrounded by a strong circular and collar-like layer of involuntary muscle bundles. The distal or abdominal ostium is of more complicated structure because of its higher function.

The many compound folds within the base of the ampullar formation and the long grooved, projecting mucosa-to-peritoneum construction with its mesothelial stroma and longitudinal muscle retracting, contracting, and relaxing structure provide for at least two forms of closure, one with, and one without, withdrawal of the fimbriae. A physiological closure doubtless obtains when the reproductive cells are not demanding tubal function. This closure is obtained by unison contraction of longitudinal and circular muscle fibers. The former are relatively much more abundant than the latter and consequently are the controlling part of the closure mechanism.

A pathologic closure involves the additional factors of a hypertrophic and hyperplastic tubal wall with a sectional or complete inclusion of its entire structure. An old and thick fibrous peritoneal coat may limit expansion. The mucosal folds may be changed by lateral or end fusings, by extensive intra- and inter-infiltration processes, or by hypertrophic, hyperplastic, and atrophic stromal changes. An endosalpingitis or perisalpingitis may not specifically designate the anatomical distribution of the morbid changes. It is evident that the fimbriae are retracted rather than inverted within the tubal lumen for in the same plane and with the same relative base attachments rugae and fimbriae may be seen. The delicate mesothelial type of stroma in the fimbriae indicates the facility with which a diminution in size of this structure may take place.

The persistence of the lumen and the preservation of the epithelium was quite remarkable in the extensively deformed specimens studied. There was but little desquamation, and flattening of cell nuclei occurred only where the surrounding change was very severe. An exception to this was seen in the case of bichloride of mercury poisoning where the only efficient protection possible was accomplished by a uniform destruction of the entire epithelium. The relatively larger size and greater number of epithelial cells in the distal portion of the tube provides for a larger fluid production just where it is most needed for the protection and propulsion of the germ cells. An excess of secretion excited by pathogenic organisms may exert a diluting power and stimulate muscle contraction closure of the ostium and muscle propulsion toward the proximal end of the tube.

The proximal ostium is a short transition from the uterus to the tubal structure. Its very efficient



long valve constructed of strong muscle fibers and primary folds is an interesting contrast to the ostium abdominale. It is a mistake to assume that this ostium is a valve consisting of a few narrow muscle fibers. Cross-sections of the uterine cornu and first portions of the tube demonstrate its extent.

If not associated with tubal pregnancy, the outward, backward, downward, and inward position of the tube found in the great majority of pathologic processes is of signal importance for protection. Rest, the first essential for tissue repair, is obtained by splinting against the ovary and uterus. When this is done the abdominal ostium becomes intimately adherent to a peritoneal surface, and in a position which favors a decrease in the blood supply and atrophic changes.

**Contreras, J. R.: The Treatment of Salpingitis** (Tratamiento de las salpingitis). *Rev. españ. de med. y cirug.*, 1920, iii, 409.

Gonorrhœa is an etiological factor in 80 per cent of cases of salpingitis, and tuberculosis, in from 3 to 4 per cent. Puerperal sepsis is another cause. Some authors estimate that the infection of the tubes is secondary to appendicitis in 22 per cent of 400 patients operated on for salpingitis. Tuberculous salpingitis is secondary to some other focus in the body. Pyogenic salpingitis is becoming less frequent as obstetrical technique is improved. The incidence of gonorrhœal salpingitis, however, is as great as one hundred years ago. The infection is found most commonly during the puerperium.

Salpingitis has been treated surgically to a very large extent and the abuse of such treatment is realized by many. The author has operated in only about 24 cases among several hundred as he believes surgical treatment is harmful unless the cases are carefully selected. Conservative methods should always be tried first.

In cases of acute salpingitis the patient should be put to bed and treated with cold packs to the hypogastrium and saline cathartics. Strong catharsis, vaginal douches, etc. are contra-indicated. In the subacute stage cold applications should be replaced by hot applications. The patient may be allowed out of bed when the fever has subsided and the pains have ceased. In chronic cases in which there is no fever or sign of acute inflammation, tampons moistened with glycerin and ichthyol may be inserted in the posterior vaginal pouch on alternating days. After the removal of the packing the patient should take a sitz bath. Vaginal douches of hot saline solution may be given twice daily. The author lays great emphasis on the importance of hot applications both within and outside of the vagina.

The tendency in surgical treatment is to remove all the pelvic organs and in many instances this is necessary. Drainage should not be employed in laparotomies for pelvic inflammatory diseases.

PIO BLANCO.

## MISCELLANEOUS

**Stajano, C.: The Phrenic Reaction in Gynecology** (La reacción frénica en ginecología). *Semana méd.*, 1920, xxvii, 243.

The author has observed clinically that gonococcal and streptococcal infections of the female genital tract give rise to a phrenic reaction. In the case of the gonococcus, the infection is propagated through the lymphatic route and the reaction is merely a simple congestion of the phrenic serosa. Streptococcal infections spread through the blood and cause lesions which are more severe. In such cases the phrenic reaction is a true high subdiaphragmatic lymphangitis of pelvic origin. This condition may be observed in women who, at menstrual or other periods, suffer an exacerbation of a parametrial or other pelvic process. The chief symptom is spontaneous and provoked pain throughout the costal border at one side of the thorax with maximum intensity at the lowest point of the diaphragm. The pain simulates the pain of an inflamed gall-bladder for as a rule it radiates to the shoulder and arm. In some cases there is vomiting and diaphragmatic paralysis. Fever is slight and the pulse is little changed. The facies is that of a peritoneal reaction.

Both the temporary congestion and the subperitoneal lymphangitis express the reaction of the higher abdominal regions. In the cases observed by the author a subphrenic abscess developed in only one instance.

The article contains typical case reports.

W. A. BRENNAN.

**Meredith, F. L.: Functional Menstrual Disturbances.** *Surg., Gynec. & Obst.*, 1920, xxxi, 382.

In this article the author reports the excellent results obtained in the treatment of more than 2,000 college girls suffering from functional menstrual disorders by measures directed solely to the correction of hygienic errors and physical underdevelopment plus the discontinuance of invalid habits at the time of the periods.

Readjustment of the mind toward the menstrual function whereby menstruation is not considered or called "sickness" but accepted as a natural phenomenon is stated to be the chief factor in the improvement.

Pelvic examination was not deemed necessary in 95 per cent of the cases, and was not necessary in a single instance later. The treatment instituted in 98 per cent of this number was that of general and special hygiene. General hygiene, including the changing of the mental attitude mentioned, consisted of increasing the bodily vigor in every way in which it was found necessary. In some cases an increase of weight improved the function of the pelvic organs and relieved the symptoms. General improvement in the circulation was responsible for many cures. In regard to some of these cases the author states that the result was attained so promptly that if it was reported exactly as it occurred the



statement would sound like a patent medicine advertisement.

In about half the number of cases constipation was marked and was considered the cause of dysmenorrhœa by reason of the associated pelvic congestion. Cathartics were replaced by diet and exercise especially adapted to relieve the constipation. In the cases in which dysmenorrhœa was not associated with constipation weak abdominal muscles with ptosis of the viscera, poor circulation, etc. were discovered. Generally weak musculature was found in some girls while others of athletic type had surprisingly weak recti and oblique muscles. Metrorrhagia and menorrhagia were sufficiently benefited to warrant a trial of this treatment if other causes are excluded. When infection was excluded the same methods gave excellent results in cases of leucorrhœa. Physical training was carried out under the direction of a physician and a physical director. The methods used are enumerated in detail.

Considerable objection was found to the wearing of a corset. No harmful results followed when the girls were allowed to go to the gymnasium, play tennis, skate, etc. during the menstrual period. Even cold baths, if the daily habit, were permitted during menstruation without ill results.

Attention is drawn to the fact that while ten years ago 75 per cent of college girls suffered from dysmenorrhœa, today only 17 per cent are so troubled. The author believes the explanation of this to be:

(1) an improved attitude of the mind on the part of girls toward the menstrual period, (2) the increasing tendency not to forego usual activity during the period.

W. H. CARY.

**Deelman, H. T.: Cancer and Marriage** (Cancer et mariage). *Gynéc. et obst.*, 1920, 1, 493.

The author has made an extensive statistical study of the localization and frequency of cancer of the uterus in relation to marriage and the number of children. On the same basis he has investigated also the relative frequency of cancers of the breast, liver, and stomach. The conclusions drawn from this study are as follows:

1. After the fortieth year of age cancer of the breast is more frequent in unmarried women than in married women.

2. Cancers of the stomach, liver, and uterus are more frequent in married women than in unmarried women.

3. Cancer of the corpus of the uterus generally occurs at a more advanced age than cancer of the vaginal portion.

4. Cancer of the corpus of the uterus is more frequent among women who have not borne children, while cancer of the vaginal portion of the uterus is more frequent among those who have borne children.

5. It is not the number of children but the fact of childbirth which plays a part in the development of carcinoma.

W. A. BRENNAN.



## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**Agusti y Planell, D.: The Social Aspect of Syphilis in Obstetrics for the General Practitioner** (La cuestión social de la sífilis en obstetricia para el médico general). *Arch. de ginec., obst. y pediat.*, 1920, xxxiii, 197.

Of 466 obstetrical cases observed clinically by the author during 1918 syphilis had been acquired during pregnancy in 23 and before pregnancy in 15. There were 4 abortions at the sixth month, 26 premature births, 17 still-born foetuses, and 21 living foetuses. Seven of the children born alive died later in the clinic.

The author discusses the effect of syphilis on pregnancy and describes the methods by which it may be detected in the mother and foetus.

Specific treatment of every case of syphilitic pregnancy is urgent whether the syphilis is congenital or acquired. The author prefers the use of gray oil and novarsenobenzol. The gray oil is injected intramuscularly, the mouth being examined frequently in order to prevent mercurial stomatitis. The novarsenobenzol is injected intravenously in small doses if the respiratory, circulatory, and renal function are satisfactory.

In the treatment of the new-born for syphilis the author uses mercurial ointment exclusively, salvarsan and its derivatives being contra-indicated because of their toxicity.

It is the duty of the obstetrician who has attended a syphilitic mother to insist on the treatment of both the mother and the child and to point out the dangers in future pregnancies if such treatment is neglected. If necessary, a threat of legal interference should be made. Legal action is warranted also when a syphilitic nurse pursues her occupation or a healthy nurse is exposed to contagion by the nursing of a child with demonstrated syphilis.

W. A. BRENNAN.

**Schwaab, A.: The Radiographic Diagnosis of Superfoetation** (À propos de la superfétation; diagnostic étayé sur la radiographie). *Presse méd.*, Par., 1920, xxviii, 677.

The possibility of superfoetation has been the subject of much controversy. In a case of twin births observed by the author the first child weighed 1,900 gm. and was apparently premature, but the second, of different sex, which was born half an hour later, weighed 2,850 gm. and was apparently born at term. The pregnancy was bivitelline, there being two distinct placental masses united by a large membranous pedicle. Because of the striking difference between the twins the author examined them with the X-ray in order to determine the condition of the lower epiphysis of the femur. It is known that ossi-

fication of this epiphysis occurs in the last fifteen days of intra-uterine life and its presence indicates that the foetus is fully developed. In the first twin studied this ossification was entirely lacking but in the other it was present. The author therefore concludes that there was a difference of at least one month in the intra-uterine life of the twins and that this was a case of superfoetation.

As twins of exactly the same intra-uterine age may differ greatly in weight at the time of birth, an X-ray examination is necessary to establish the occurrence of superfoetation. W. A. BRENNAN.

**Bourne, A. W.: A Case of Spontaneous Rupture of the Uterus Following an Administration of Pituitary Extract.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Obst. & Gynaec., 205.

The patient was a 12-para with normal pelvic measurements and a history of normal previous labors, whose last child was born two years ago. When the os was fully dilated and the head was on the perineum,  $\frac{1}{2}$  c. cm. of pituitary extract was given hypodermically as the pains were ineffectual. One hour later very severe pains began, the patient gave a sharp cry, and at once went into extreme shock. She was immediately removed to the hospital where restorative measures were instituted. Her general condition having been improved, the child's head was removed by perforation and cutting through the neck. The manipulation of delivering the head, however, caused a second sudden and very severe collapse and the patient died four hours after the administration of the pituitrin.

The autopsy revealed the child's trunk and the placenta free in the abdomen, the uterus being retracted behind it, and a large quantity of free blood. In the peritoneum of the anterior leaflet of the broad ligament was a tear 7 in. long, opening up the uterovesical pouch anteriorly. In the uterine wall was a tear 5 in. long, beginning at the left lateral wall of the lower segment and extending downward and inward to the cervix. Sections at the site of the lesion showed an extreme degree of fibrosis and very few muscle fibers. C. H. DAVIS.

**McGlinn, J. A.: Extraperitoneal Caesarean Section.** *Am. J. Obst. & Gynec.*, 1920, i, 45.

The author discusses the history of caesarean section up to Nicholson's review in 1914 and states that since 1914 very little has been written on the subject.

The disadvantages of the classical caesarean section are summarized as follows:

1. In the non-elective cases the maternal mortality is higher than in the elective cases. The mortality increases with the length of labor prior to



operation, the rupture of the membranes, the number of vaginal examinations, and the attempts at vaginal delivery. The mortality is dependent upon infection, usually peritonitis.

2. Rupture of the uterus in the site of the scar in subsequent pregnancies and labors is relatively frequent.

3. Adhesions are formed between the uterus and the abdominal wall.

4. The abdominal scar is unsightly and there is a possibility of incisional hernia.

5. Postoperative intestinal complications may develop.

The advantages of the two types of extraperitoneal operation are summed up as follows:

1. As the peritoneal cavity is not opened and is isolated from the field of operation, the danger from infection is less and therefore these operations are better adapted to infected or supposedly infected cases.

2. If the uterus ruptures in the site of the incision in subsequent pregnancies or labors it is of no material consequence and there is no danger from the formation of peritoneal adhesions.

3. The scar is not unsightly and there is little possibility of incisional hernia.

4. There are no postoperative intestinal complications.

5. Hæmorrhage during the operation is slight.

The disadvantages of the extraperitoneal operation are:

1. It is unquestionably more difficult and time-consuming than the classical cæsarean section.

2. On account of the time it consumes it is not applicable to the rare case in which speed is necessary to save the child.

3. There is danger of injury to the bladder and ureter. This accident has been referred to frequently in the literature.

4. It is not applicable to cases of placenta prævia.

5. It has no place in the frankly infected case.

6. In clean cases in which there is a positive indication for section it is usually not possible to repeat the same operation (extraperitoneal).

7. Its morbidity is high. In 298 cases the morbidity was 30.7 per cent, and the condition in 25 per cent of these cases was due to infection.

C. H. DAVIS.

### LABOR AND ITS COMPLICATIONS

Pierce, G. H.: *Outlet Pelvimetry*. *Med. Rec.*, 1920, xcvi, 723.

Outlet pelvic mensuration is so important and yet is so little understood and practiced (in general) that its principles cannot be too often brought before the medical profession. It concerns every physician who attends women in childbirth to know the size of the pelvis, both its inlet and its outlet.

*Description of the Pelvic Outlet.*—By the term "outlet" is meant the bony outlet. This comprises the two planes which may be considered practically

as one area bounded by the pubic arch and the immovable anterior tip of the sacrum. When this area is too small, a child's head which normally fits under the pubic arch cannot pass uninjured. It is in such cases that the forceps are so often used with destructive effects to both the child and the mother. If knowledge of the limited area is gained beforehand, as it can be gained by measuring antepartum or even in the early part of labor, other means of delivery may be substituted. The attempt to drag a head through a pelvis that is too narrow is not warranted. We may not be able to measure the child's head accurately, but we can tell by measuring when a pelvis is too small for any head to pass.

*The Pelvic Diameters.*—The transverse diameter of the pelvic outlet is the distance between the lowest innermost margins of the tuberosities of the ischium. In the living, this is normally 10.5 cm.

The distance from the transverse diameter to the anterior tip of the sacrum is the posterior sagittal diameter; the distance in a straight line from the center of the transverse diameter to the subpubic arch is the anterior sagittal diameter; and the distance from the subpubic arch to the anterior tip of the sacrum is the anteroposterior diameter of the pelvic outlet. Geometrically these lines form a triangle.

In funnel pelves the available outlet is practically between the transverse diameter and the anterior tip of the sacrum:

If the transverse diameter is									
8	cm.,	posterior	sagittal	must	be	at	least	7.5	cm.
7	"	"	"	"	"	"	"	8	"
6.5	"	"	"	"	"	"	"	8.5	"
6	"	"	"	"	"	"	"	9	"
5.5	"	"	"	"	"	"	"	10	"

The head of average size will pass the outlet if the transverse diameter is 8 cm. or above and the posterior sagittal is 7.5 cm., the normal length.

In pelves of normal size the subpubic arch is wide enough for the head to pass immediately beneath it, but when the pubic arch is narrow the head must pass, if at all, below the arch at a distance down the pubic rami which varies according to the degree of narrowing. In order that this may be possible, the tip of the sacrum must be located farther back than it is in its normal position. If there is sufficient compensation, a new available outlet is formed, the transverse tubero-ischial diameter being substituted for the pubic arch and the posterior sagittal diameter being substituted for the anatomical anteroposterior diameter.

*To Measure the Pelvic Outlet Diameters.*—The pelvic outlet diameters are the tubero-ischial or transverse, the posterior sagittal, and the anteroposterior. The transverse measurement is made between the lowest inner margins of the tuberosities of the ischium. The anteroposterior is measured from the subpubic arch within the vagina to the tip of the sacrum posteriorly, 1 cm. being deducted to allow for the thickness of the sacral tip. The posterior sagittal diameter cannot be measured



directly, but may be approximated by carrying the tip of the pelvimeter backward over the tissues to the tip of the sacrum posteriorly and subtracting 1 cm. to allow for the thickness of the tip. It is impossible to measure this diameter without having a fixed transverse base line. The instrument presented in Fig. 1 furnishes a base and measures a transverse of from 6 cm. to 11 cm. and the other diameters as required. Figures are placed conspicuously at 8 cm. on the transverse rod and at 8.5 cm. on the curved rod to fix the attention upon these points because they represent limits between which the head may pass.

The instrument is regulated by a screw action. The caps screw out and in, and the curved rod screws up and down through the transverse rod. The scale on the rods is marked at  $\frac{1}{2}$  cm. intervals. To measure 7, 8, 9, 10 cm., etc. on the transverse rod, the screw caps are placed at corresponding figures on each side of the central rod to indicate the increase or decrease of 1 cm.

The normal length of the transverse tubero-ischial diameter as measured in the living subject, i. e., over the tissues, is 10.5 cm., and the normal length of the posterior sagittal diameter is 7.5 cm. Spontaneous birth of the head is still possible when the tubero-ischial diameter is shortened to 8 cm. if the posterior sagittal remains 7.5 cm. If the tubero-ischial diameter is shorter than 8 cm., the head will not pass unless the posterior sagittal is lengthened.

At the distance of 8.5 cm. from the tip of the curved rod on the pelvimeter in a straight line the figures  $8\frac{1}{2}$  are placed because the measurement from this point on the cross bar to the tip of the sacrum externally, less 1 cm., represents the normal length of the posterior sagittal diameter, 7.5 cm. (the measurement to the tip of the sacrum internally). The posterior extremity of the true sagittal diameter is at the tip of the sacrum on its anterior surface internally, so that 1 cm. must always be subtracted from the distance actually measured externally. Other figures up to 13.5 cm. are similarly placed on the rod at 1 cm. and  $\frac{1}{2}$  cm. intervals. These indicate the other distances to which the posterior sagittal diameter must be lengthened to compensate for the variations in shortening of the tubero-ischial diameter. Thus if the reading for the posterior sagittal is 8.5 cm., the actual diameter is 7.5 cm.

Place the patient in the dorsal or lithotomy posture with the tip of the sacrum well over the edge of the table.

Palpate the ischial rami downward with the thumbs to the lowest innermost limits of the tuberosities of the ischium at about the level of the anus to estimate the transverse diameter.

Hold the bar of the pelvimeter, which now measures the transverse diameter, in position, and measure the posterior sagittal diameter by bringing the tip of the curved rod around to the tip of the sacrum and subtract 1 cm. from the distance measured. For trial, the upper margin of the transverse rod may be fixed on the perpendicular rod at the 8.5 cm. mark.

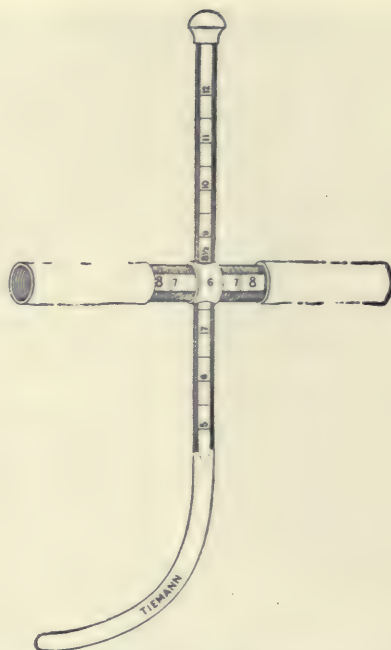


Fig. 1. Represents the new instrument set for the first tryout ( $8 \times 8\frac{1}{4}$ ).

Before measuring the posterior sagittal diameter, lay the instrument aside for a moment and palpate the coccyx to locate the tip of the sacrum. Keep a finger here or mark the point with a small strip of adhesive plaster. Replace the upper margin of the transverse bar at the tubero-ischial level and see if the tip of the perpendicular curved rod with the transverse fixed at the  $8\frac{1}{2}$  cm. mark on the perpendicular rod will swing around to the tip of the sacrum; if it does, the length of the posterior sagittal diameter will be 7.5 cm., the normal length. If it does not reach this point, screw the rod down or up until it reaches it, and note its length.

*To Locate the Tip of the Sacrum.*—If the tip of the sacrum is not easily felt externally, palpate the coccyx by introducing the index finger of one hand into the vagina, making counter-palpation with one or two fingers of the other hand on the outside. The rectum should be empty. The coccyx is composed of four bones which, in the author's experience, are partially movable, especially in young subjects.

The coccyx is about  $1\frac{1}{4}$  in. long (3 cm.). Therefore, on the basis of its usual length, its upper termination will be approximately  $1\frac{1}{4}$  in. above its tip.

Do not forget to measure the occipitofrontal diameter of the child's head through the abdominal wall (normal 11.50 to 11.75 cm.) and subtract 2 cm. which will give approximately the bi-parietal diameter (normal 9.25 to 9.50 cm.).

Instead of subtracting 1 cm. in measuring the posterior sagittal diameter, the actual measurements





Fig. 2. Represents the new pelvimeter measuring a transverse diameter of 9.5 cm. and a posterior sagittal diameter of  $6\frac{1}{4}$  cm. The upper margin of the transverse bar of this instrument rests at the transverse of the outlet, it being more satisfactory to push the upper margin of the ends up against the tuberosities when measuring.

to the outside tip of the sacrum which are necessary in order that the head may come through the outlet may be substituted. A table for immediate computation without subtracting would read as follows:

#### AVAILABLE OUTLET BY DIRECT MEASUREMENT

Transverse diameter									
8	cm., distance to outside tip of sacrum must be	8.5	cm.						
7	" " " " " " " " " "	9	"						
6.5	" " " " " " " " " "	9.5	"						
6	" " " " " " " " " "	10	"						
5.5	" " " " " " " " " "	11	"						

This means that if:

Transverse diameter is									
8	cm., the posterior sagittal would be	8.5	- 1 =	7.5	cm.				
7	" " " " " " " " " "	9	- 1 =	8	"				
6.5	" " " " " " " " " "	9.5	- 1 =	8.5	"				
6	" " " " " " " " " "	10	- 1 =	9	"				
5.5	" " " " " " " " " "	11	- 1 =	10	"				

Phillips, J.: The Induction of Premature Labor; Its Scope and Present Results. *Lancet*, 1920, cxcix, 741.

The operation for the induction of premature labor is of English origin, being done first in 1756 by Macaulay. A similar operation was not per-

formed in France until 1831, probably because of religious objection to it. The early operation consisted of rupturing the membrane with a stilette. Later efforts were directed toward less dangerous methods, including the use of sponge tents by Kluge, the injection of carbonic acid gas by Simpson and Scanzoni, hot vaginal douches by Kiwisch, separation of the membranes in the lower uterine segment by Hamilton, the injection of creosote water by Cohen, and the injection of glycerin by Peltzer. These methods, however, led to disastrous results. Dilatation of the cervix by sponges, laminaria, and India rubber bags placed in the cervical canal led de Ribes in 1888 to design his variety of dilating bags. With regard to drugs, the author states, "I believe it is now generally acknowledged that no known drug will initiate uterine labor pains, but that when these are once started, ergot, and more recently pituitrin, the latter especially, have the power of insuring their continuance, and indeed, of adding to their potency."

The use of the sponge tent is the most dangerous means of inducing labor. The laminaria tent, which may be kept aseptic in a 1:1,000 alcoholic solution of mercury, both softens the cervix and dilates it. The author inserts from one to three of the long laminaria tents into the cervix, removes them in eighteen hours, and then inserts the small de Ribe's bag. The importance of the weighted bag is emphasized.

Premature induction is indicated by conditions such as contracted pelvis, acute albuminuria, complicating fibroids, placenta prævia, and cardiac disease.

In 161 cases reported there were 7 maternal deaths (4.3 per cent). Of the 164 children in these cases 24 died, a mortality of 14 per cent. The causes of the maternal deaths were acute bronchitis, multiple fibroids with twins, acute yellow atrophy, ventrofixation and bicornate uterus, placenta prævia, and eclampsia. Eight of the foetal deaths were due to prematurity with meningeal hæmorrhage and atelectasis; 3 to breech delivery associated with placenta prævia; 2 to acute infection; 3 to eclampsia; and 2 to premature induction of labor because of impending foetal death. As the maternal death in these cases was not the result of the induction, the procedure may be regarded as unattended by mortality.

Nine unusual cases are reviewed in detail. In the case of a patient with pneumothorax, labor was induced at the thirty-sixth week of pregnancy because of severe dyspnoea, and delivery was effected by means of forceps as soon as the cervix had been dilated two-thirds. Labor was induced prematurely also in 2 cases of bacillus coli infection; in one case twins presenting in occipitoposterior position were delivered with the forceps and in the other a dead foetus was delivered by forceps and two-thirds dilatation of the cervix. In a case of enlarged thyroid the induction of labor relieved the dyspnoea. In 2 cases of empyema and 1 of secondary carcinoma of the liver the induction of labor was followed



by spontaneous delivery. In 1 case labor was induced at the thirty-sixth week because of painful contractions, and in another because of osteosarcoma of the thigh.

In a discussion of the advisability of cesarean section in some of these cases the author states that if they had occurred within the last ten years this operation would probably have been the treatment of choice in several instances. With regard to the methods of inducing labor he is of the opinion that if time is not an object the insertion of from one to three bougies well up to the fundus is fairly safe. The cervix is softened and an anæsthetic is unnecessary for this part of the procedure. In the cases of multiparæ the bag alone is sufficient. In 5 cases labor was completed very easily within twenty minutes after manual dilatation alone under an anæsthetic. Examination at the end of the puerperal month revealed no signs of laceration of the cervix.

W. N. ROWLEY.

**Reed, C. B.: The Induction of Labor at Term.**  
*Am. J. Obst. & Gynec.*, 1920, i, 24.

At maturity the fœtus varies in length from 48 to 53 cm. and weighs between  $5\frac{1}{2}$  and 9 lbs. Its head at this period measures from 10 to 12 cm. in the occipitofrontal diameter and from 8.5 to 10 cm. in the biparietal diameter.

As soon as the fœtus has become mature labor should be induced. In cases of pelvic contraction the anomaly becomes apparent as soon as the proper tests are applied.

Labor may be induced by the administration of castor oil and quinine and pituitrin or by the use of the modified de Ribes bag (Vorhees bag). Castor oil and quinine act in about two or three cases out of five, and most reliably when the pregnancy has continued slightly beyond the calculated date. In the author's experience the bag has been the most dependable agent.

In a series of 200 cases reviewed, 114 were those of multiparæ and 86 those of primiparæ. The average duration of labor was seven hours and fifty-six minutes. The longest labor was thirty hours and was due largely to a tough, inelastic cervix. Two others were twenty-eight hours in length on account of cervical conditions. In one of these a mass of cicatricial tissue was present. The shortest labors were fifty-five and sixty minutes in length, the former that of a multipara and the latter that of a primipara. In 9 cases the bag broke while being filled or shortly after its insertion. A second bag was necessary in 4 cases. The membranes were ruptured by the insertion of the bag in 7 cases—in 1 case intentionally on account of hydramnios. The bag was expelled in an average period of three hours and twenty minutes, the longest period of retention being nine hours and the shortest ten minutes. Two mothers died. One had myocarditis associated with marginal insertion of the placenta. The labor in this case lasted only an hour and a half and less blood was lost than usual, but death occurred two

hours after delivery. The other had pneumonia and died eight days after delivery.

In no case did the bag fail to initiate the pains or bring about delivery. The average weight of the babies was 7.4 lb. The smallest weighed 5 lb. and the largest 10 lb. Twelve babies died.

Version and extraction were done in 4 cases because of placenta prævia, transverse presentation, prolapse of the cord, and to expedite labor in a case of cardiac disease.

Forceps were used 39 times, the indication being occipitoposterior position in 11 cases; deep transverse arrest in 15 cases; insufficiency of power in 4 cases; slow labor in 5 cases; and for instruction in 4 cases.

There were 2 cases of prolapsed cord.

Certain objections have been made to the use of the bag for the induction of labor. The most persistent of these is based on the menace of infection. If the technique used is correct this danger may be disregarded.

In the author's opinion no harm is done by the induction of labor when the child is mature and much danger is averted. By a judiciously timed procedure the contractions of labor may be induced when the child is mature but still small enough to pass the pelvic canal without extreme difficulty. The mother is spared from four to six hours of suffering as well as serious operative trauma, and she rises from her confinement quickly and with unimpaired vitality.

E. L. CORNELL.

**DeLee, J. B.: The Prophylactic Forceps Operation.**  
*Am. J. Obst. & Gynec.*, 1920, i, 34.

The "prophylactic forceps operation" is the routine delivery of the child in head presentation when the head has come to rest on the pelvic floor, followed by the early removal of the placenta. This method is applied to primiparous labors and those in which the condition of the soft parts approximates a first labor. The procedure is a technique for the conduct of the whole labor, the purpose of which is to relieve pain by supplementing and anticipating the efforts of nature, to reduce the hæmorrhage, and to prevent or repair damage.

A typical case is treated as follows:

As soon as the pains are well established and the cervix is opened 2 to 3 cm. the patient is given  $\frac{1}{6}$  gr. of morphine and  $\frac{1}{200}$  gr. of scopolamine. After one hour  $\frac{1}{400}$  gr. of scopolamine is given and, occasionally, in one or two hours, a third dose of the same size. The room is darkened and suggestion is employed as much as possible to aid the drugs. This is really a modified twilight sleep and usually the cervix dilates and the head comes down on the perineum without the necessity for further drugs. Occasionally 15 gr. of choral and 40 gr. of sodium bromide are given per rectum to aid the morphine, or gas and oxygen are administered by an expert. It is important to obtain complete spontaneous dilatation of the cervix, the slower the better. The importance attached to this point, the



natural dilatation of the cervix and the slow retraction of the pericervical connective tissues, cannot be exaggerated.

When the head has passed the cervix, rests between the pillars of the levator ani, and has just begun to part them and to stretch the fascia between them (this may be determined easily by rectal examinations) the patient is put to sleep with ether and a typical perineotomy is performed. Under the minutest possible control of the foetal heart-tones—either the operator or the assistant listening every minute with a head stethoscope—the forceps are applied and delivery is accomplished. As a rule this is surprisingly easy. As soon as the child's head is born, 1 c. cm. of Burroughs and Wellcome pituglandol is injected into the deltoid muscle. A nurse stands ready with 1 c. cm. of aseptic ergot and this is injected into the outer thigh muscles as soon as the placenta is visible in the vulva. If there is hæmorrhage, the placenta is removed at once, but if hæmorrhage does not occur, the operator either changes his gloves or disinfects them with antiseptics and then, if the placenta is not visible in the vulva, inserts the left hand into the vagina or the lower uterine segment, palm up, and with the other hand pushes the hard uterus (pituitrin) down on the already descended placenta. The placenta slides down the hand in the same way as a heel slides along a shoehorn. If there is any undue bleeding, another ampoule of pituitrin is injected directly into the uterine muscle through the abdominal wall.

The patient is then given  $\frac{1}{4}$  gr. of morphine and  $\frac{1}{200}$  gr. of scopolamine to reduce the necessity for much ether for the repair work, to prolong the narcosis for many hours postpartum, and to abolish the memory of the labor as much as possible.

It is surprising how bloodless the operative field, especially the cervix, has become.

The cervix often tears even in spontaneous deliveries. Frequently tearing of the body of the cervix leaves the internal and external mucosa intact. Later such cervixes show all the evidences of laceration, chronic inflammation, eversion, erosion, etc. Lacerations which are open show also the separation of the muscle of the cervix at the sides. In such cases the deep retracted portions of the wound must be pulled out and united, preferably with buried sutures. In the author's opinion, previous failures in cervical repair were due to non-recognition of this fact.

Most of the damage caused by labor is due to injury, rupture, distraction, and displacement of the fascia rather than to tearing of the muscles. Preventive measures, therefore, must be directed toward preserving the fascia in its normal position throughout the parturient canal. When overstretching or rupture cannot be avoided, an incision should be made in the structure at a point where it can be repaired by suture.

Little can be done directly to save the pericervical connective tissues from radial and longitudinal

overstretching and tears, but indirectly they can be spared by avoiding all interference with the natural processes of dilatation of the cervix and restraining the natural powers if they are too violent. This means the avoidance of the use of bags to hasten the dilatation, of manual stretching, of urging the parturient to bear down before the head has passed the cervical barrier, and especially of the administration of pituitrin before the cervix has completely opened. In addition to the measures for preserving the connective tissues of the upper pelvis direct action may be taken to save the fascial and muscular structures of the pelvic floor.

The first incision, which is made through the skin and urogenital septum, exposes the pillar of the levator ani covered with the fascia endopelvina. The next, made in the vagina and the upper layer of the levator and fascia, exposes the rectum, which is seen at the bottom of the wound covered with its fascia propria. Next, the fibers of the fascia communicating with the urogenital septum are cut. This allows the perineal body with the sphincter ani and rectum to fall to the side opposite the cut. Simple episiotomy will not prevent injuries to the pelvic fascia. When the disproportion between the head and the pelvic floor is great, the muscular belly of the levator ani is incised at a right angle to the length of the fibers.

The repair is made with catgut, layer by layer—vagina, muscle, fascia, urogenital septum, subcutaneous fat and fascia, and skin—all in anatomico-surgical fashion. Primary union is the rule and examination later shows that virginal conditions are usually restored.

The author admits freely that this method of treating labor is a revolutionary departure from time-honored custom and must have a really sound scientific basis for its recommendation. Such a basis it has:

First, it saves the woman the debilitating effects of suffering in the first stage and the physical labor of a prolonged second stage, and for the nervous, inefficient woman, the product of modern civilization, this is becoming necessary more frequently. The saving of blood has much to do with the quick and smooth recoveries observed. In the combination of morphine and scopolamine in the first stage, gas or ether in the second stage, and operative delivery, labor has been robbed of most of its terrors.

Second, it undoubtedly preserves the integrity of the pelvic floor and introitus vulvæ and forestalls uterine prolapse, rupture of the vesicovaginal septum, and their long train of sequelæ. Virginal conditions are often restored.

Third, it saves the child's brain from injury and the immediate and remote effects of prolonged compression. Incision in the soft parts not only shortens the second stage but relieves the pressure on the brain and therefore should reduce the incidence of idiocy, epilepsy, etc. The easy and speedy delivery prevents asphyxia and its immediate and remote effects on the early life of the infant.



There are three objections to the innovation. One of these is a very real objection, but will be only temporary. This latter is that prophylactic forceps will be made an excuse by unskilled accoucheurs for the hasty termination of labor, not in the interests of the mother and babe, but for their own selfish ends. The other two objections are based on the possibility of infection and the dangers to the child from an improperly performed forceps delivery, brain injury and compression of the cord. If the woman has an evident infection or if there is a suspicious leucorrhœa, the operation is contra-indicated. In skillful hands the danger of the procedure is nil.

The results of this new method of treating labor are most satisfactory. As yet, no mother or baby has died, there has been no case of infection or cerebral hæmorrhage, the babies have thrived and the mothers have not shown the exhaustion and anæmia noted formerly. The restoration of the parturient canal has been always perfect. In the author's opinion the involution is quicker and more complete, retroversion of the uterus is more infrequent, and the recovery much more rapid than following older methods.

E. L. CORNELL.

#### MISCELLANEOUS

**Brown, W. H., and Pearce, L.: On the Reaction of Pregnant and Lactating Females to Inoculation with *Treponema Pallidum*—A Preliminary Note.** *Am. J. Syphilis*, 1920, iv, 593.

The results reported show very clearly that the reaction of the rabbit to a genital inoculation with *treponema pallidum* which practically coincides with conception differs very decidedly from that of the normal animal inoculated in the same way, and that this difference extends through the period of pregnancy and well into the period of lactation.

The differences noted were of two kinds. Ordinarily it appeared that the defensive mechanism of the pregnant animal was capable of opposing a resistance to inoculations performed at the time of conception such that little or no clinical sign of infection appeared, a condition possibly analogous to that upon which Colles' law was founded. In other instances, however, slight local lesions and marked constitutional disturbances were produced which suggested an ineffectual resistance to the infection or a breaking-down of the defensive mechanism. The two extremes seem to justify the assumption that there must be a third type of condition approaching more nearly that seen in the normal animal.

The demonstration of these fundamental facts concerning the reaction of pregnant and lactating animals to inoculation with *treponema pallidum* furnishes a starting point for the investigation of a wide range of problems regarding infection and resistance in states of pregnancy and lactation and, by contrast, may be the means of approaching the more general problem of the defensive mechanism of the normal animal.

E. L. CORNELL.

**Williams, J. W.: The Value of the Wassermann Reaction in Obstetrics, Based upon the Study of 4,547 Consecutive Cases.** *Bull. Johns Hopkins Hosp.*, 1920, xxxi, 335.

For a number of years the author employed the Wassermann test only when the presence of syphilis was suggested by some fact in the patient's history. Although his investigations had shown that syphilis is a frequent complication of pregnancy and one of the common causes of foetal death, he did not appreciate its full significance in obstetrical work until 1915. At that time he studied the foetal and infantile deaths in a series of 10,000 consecutive deliveries, and in his presidential address before the American Association for the Prevention of Infantile Mortality stated that syphilis was the most important single cause in 26 per cent of the deaths occurring in his service between the end of the seventh month of pregnancy and the two weeks immediately following delivery.

As the result of his study, Williams came to the conclusion that the most immediately fruitful field for prenatal work lay in the earliest possible recognition of the presence of syphilis and its intensive treatment during pregnancy and that this could be accomplished best by making a Wassermann test upon every patient entering the service. Consequently, from April, 1916, to the present time, it has been the routine procedure to obtain a specimen of blood for a Wassermann test from every patient at her first visit to the dispensary. If a positive Wassermann is obtained, intensive treatment is given in the syphilis department of the hospital. In addition, in the hope of increasing our knowledge concerning the incidence of the disease as well as its clinical significance for the mother and child, a Wassermann test was made also of a sample of foetal blood obtained from the umbilical cord immediately after delivery, every placenta was weighed and studied both macroscopically and microscopically, and in autopsies on children which were born dead or died within the first two weeks of the puerperium particular attention was paid to the detection of syphilitic lesions and the presence of spirochætæ in the foetal organs.

This article is based upon the cases of 4,000 women and their children studied in the service out of 4,547 patients admitted between April, 1916, and December 31, 1919. The numbers of white and negro patients were about equal, being 1,930 and 2,161 respectively.

Williams discusses the part played by syphilis in the causation of foetal death, the significance of the maternal and foetal Wassermann tests, the value of a microscopic examination of the placenta in the detection of syphilis, and the status of Colles' law. His remarks in this article concerning syphilis as a cause of foetal death are comparatively brief for the reason that the subject was considered in detail in his article "The Significance of Syphilis in Prenatal Care and in the Causation of Foetal Death" which appeared in the *Bulletin of the Johns*



*Hopkins Hospital* for May, 1920, an article based upon the study of 302 foetal deaths—99 those of white children and 203 those of negro children—which occurred in the 4,000 deliveries under consideration.

Of the 4,000 women delivered during the period under consideration, 449 (11.2 per cent) presented a positive reaction during pregnancy. The incidence of syphilis was much greater among the negro women than the white women, being 16.29 per cent and 2.48 per cent, respectively. In other words, a positive Wassermann was noted in every sixth colored woman as compared with every fortieth white woman.

The author does not make a conclusive statement regarding the significance of a positive Wassermann reaction in a pregnant woman, but says definitely that a positive Wassermann test of the mother does not necessarily mean that her child will develop syphilis.

On the basis of his study Williams has come to the conclusion that the information obtained from a Wassermann test of the foetal blood at birth is not commensurate with the time consumed or the money expended in such investigations. This opinion is shared by Fildes, who in 1915 reported that he had found a positive Wassermann reaction at the time of birth in 14 of 1,015 children (1.3 per cent) and that prolonged observation showed that only

one of them subsequently developed clinical syphilis. Seven of the others who were examined later had a negative Wassermann test, while in the cases of 3 others the negative test later became positive.

Williams does not claim to offer irrefutable evidence in favor of Colles' law, but quotes one case as highly suggestive. In this instance the records of the microscopic examination of the placenta from the preceding labor and from eleven labors following a supposed superfecundation show that all were normal. Furthermore, all of the other children were born in good condition and were somewhat above the average in weight. Consequently it seems safe to affirm that the only evidence of syphilis in the remarkable reproductive career of this patient was in one of the double-ovum twins and that if the husband had been responsible for it some of the other children would have presented evidences of the disease. As this was not the case, the assumption appears warranted that the paternity of the syphilitic child was different from that of the other children, that the infection was a paternal infection, and that the mother exemplified Colles' law.

The author does not attempt to carry the argument further but states that in his opinion the possibility of spermatic infection and the admissibility of Colles' law have not yet been conclusively proved or disproved, and consequently should be regarded as still *sub judice*.  
G. E. BELLBY.



## GENITO-URINARY SURGERY

### ADRENAL, KIDNEY, AND URETER

Porter, L., and Carter, W. E.: Observations on Tumors of the Kidney Region in Children. *Am. J. Dis. Child.*, 1920, xx, 323.

Tumors in the region of the kidney in children may be either benign or malignant. Cystic enlargements of the kidneys are fairly common. The benign growths are adenomata, angiomata, lipomata, and fibromata.

Malignant tumors of the kidney may be classified in general as carcinomata, sarcomata, and hypernephromata. Such tumors are usually found in young patients, their incidence being highest between the ages of 6 months and 6 years. Of all malignant growths affecting children those involving the kidneys appear to be second in number. In 393 cases the kidney was involved in 20 per cent.

Sarcomata have been found in the kidney as early as the sixth month of foetal life and in some instances the tumor mass may become so large that it obstructs labor.

As the symptoms and signs of malignancy of the kidney are fairly uniform, a diagnosis is usually possible before the child is cachectic. The early stages are characterized as a rule by a period of anorexia, malaise, and vomiting associated with pain and a progressive loss of weight.

Ballottement at the costovertebral space is of paramount importance as a diagnostic measure. Intermittent hæmaturia is frequently noted. The recently developed method of injecting oxygen and carbon dioxide into the peritoneal cavity has made the roentgenogram a valuable aid in the diagnosis.

Children affected with kidney tumor usually die within a year unless treated surgically.

Care should be taken not to confuse malignant kidney tumors with hydronephrosis, which is produced by damming back of the urine due to obstruction of the ureters.

W. E. LOWER.

McCown, P. E.: Papillomatous Epithelioma of the Kidney Pelvis. *J. Am. M. Ass.*, 1920, lxxv, 1191.

In this article the author reports one case of papillomatous epithelioma of the kidney pelvis and gives abstracts of 9 American and 38 foreign case reports.

The tumor seems similar in structure to a benign bladder papilloma, consisting of a connective-tissue stalk, sometimes branching, which is surmounted by between fifteen and twenty layers of epithelial cells described by various writers as columnar, cuboidal, cylindrical, and in some instances as squamous in type. There may be a single papilloma or the growth may cover the entire mucous mem-

brane of the pelvis, extending into the calices and along the surface of the ureter. Occasionally transplants on the bladder mucosa are found.

The diagnosis is difficult. A palpable tumor was discovered in one-third of the cases reviewed. Hæmaturia, the most common symptom, was present in 33 cases. In 12, it was associated with renal colic. Pain other than colic is rare. The presence of a papilloma within the ureteral orifice is suggestive. A cystoscopic examination, an examination of the urine, functional tests, and pyelograms should be made.

In the cases reviewed the ages of the patients varied from 32 to 86 years. In 17 cases the condition developed in the fifth decade of life. Almost two-thirds of the patients were men. The left kidney was most commonly involved. Murchison reported 1 case of bilateral involvement.

Metastatic growths in other organs were reported in 11 cases. It is probable that without surgical treatment the condition would be fatal in every instance. The treatment indicated is nephrectomy and ureterectomy.

Kraft, S.: The Spontaneous Cure of Hypernephroma (Selbstheilung bei Hypernephrom). *Ztschr. f. urol. Chir.*, 1920, v, 16.

The patient was a man 46 years of age who first showed signs of kidney disease thirty-seven years previously. At intervals of several years thereafter blood and large amounts of pus appeared in the urine in association with attacks of chills and fever. A nodular tumor then became palpable and led to the diagnosis of polycystic degeneration of the left kidney. This diagnosis was confirmed by operation.

The cystic degeneration was found to be confined to the lower two-thirds of the kidney, the other third being normal. Only the degenerated portion was removed. Histologic examination of the removed cysts failed to reveal any epithelial covering and therefore it was impossible to determine the nature of the degeneration.

After six months which were free from symptoms the attacks of colic recurred. The urine remained normal in quantity, however, and contained no blood, albumin, or sediment. Bilateral catheterization also was negative. Subsequently a somewhat smaller and distinctly nodular tumor became palpable in the region operated upon. A second operation again showed that the kidney consisted of a cystic portion and a normal portion. In a circumscribed area in the cystic portion hypernephroma tissue was found.

The explanation of this cystic degeneration of a hypernephroma which had been present for a long time the author sees in: (1) a separation of the



tumor cells with extrusion of colloid into the lumen whereby the epithelial covering was destroyed by the pressure due to the increase in the cyst contents, and (2) the tendency of the tumor tissue to undergo necrosis and softening. The first change evidently took place during the period the patient passed blood and pus in the urine and the second during the later periods so that finally only a few microscopic rests of the hypernephroma remained to reveal the character of the growth.

In the few cases of spontaneous cure of hypernephroma by cystic degeneration and pressure atrophy reported in the literature the cyst formation was always unilocular. A polycystic change such as that in the case here reported has not been described previously.

HARMS (Z).

**Beer, E., and Hyman, A.: Progress in Nephrectomy: A Study Based on a Series of 207 Cases.**  
*J. Am. M. Ass.*, 1920, lxxv, 1180.

The authors report 207 nephrectomies, the majority of which have been performed since the reorganization of the surgical services at the Mt. Sinai Hospital, New York, in 1914. In that year, group segregation was first practised, all renal cases being assigned to the special kidney service. There were 8 deaths following operation in this series of 207 cases, a mortality of 3.8 per cent. To show the progress that has been made in urologic surgery reference is made to a series of 112 nephrectomies performed by Gerster and his associates at Mt. Sinai Hospital in the preceding sixteen years, in which the mortality was 21 per cent. That the marked reduction in the mortality was not due solely to the gradual and general development in urology, however, is evident from a series of nephrectomies performed during the same years as those reported in this article by the occasional operator, in which the mortality rate was three times as high as that of the special kidney service. A number of factors are responsible for the improvement. The authors are of the opinion that group segregation of cases, which makes possible intensive work along special lines, aids in developing diagnostic acumen and operative technique, and that in the study of complicated cases the judgment so acquired proves invaluable. This point is rather forcibly shown in statistics reported by Thomas, who found that the mortality from nephrectomy and prostatectomy in the hands of general surgeons is 25.9 and 22.5 per cent respectively as contrasted with 7.7 and 4.33 per cent in seven times the number of operations performed by eight of the world's most noted urologists.

Probably the most important of the factors responsible for the marked reduction in mortality is the careful and exacting pre-operative study to which every urologic case is subjected. This includes urinalysis, roentgenography, pthalein test, cystoscopy, and ureteral catheterization combined with the use of indigo-carmin as a test of individual renal function, wax tipped bougies, pyelography, blood chemistry, and blood-pressure estimations.

The operative and postoperative work was also carefully standardized.

The indications for nephrectomy are divided according to pathologic conditions as follows:

	Cases	Deaths	Mortality Per cent
1. Tuberculosis.....	92	2	2.1
2. Extensive destruction of kidney due to suppuration with or without stone.....	49	1	2.03
(a) Calculous pyonephrosis..			
(b) Calculous pyelonephritis			
(c) Suppurative nephritis. Pyelonephritis and multi- ple abscesses.			
3. Extensive destruction of kidney as in hydronephrosis, with or without secondary infection..	36	3	8.3
(a) Hydronephrosis			
(b) Pyonephrosis			
4. Neoplasms.....	27	2	7.4
5. Rupture.....	1	0	0.
6. Persistent ureteral fistula.....	1	0	0.
7. Gunshot wound.....	1	0	0.
Total.....	207	8	3.86

Comparative tables of statistics gathered from a review of the literature are given to show the gradual decline in mortality following nephrectomy from decade to decade. Lumbar and transperitoneal nephrectomy are discussed as are also their indications and contra-indications. Of the 207 nephrectomies, 199 were lumbar extirpations, and 8 transperitoneal; 189 primary, and 18 secondary operations. Subcapsular nephrectomy was performed 12 times.

The conditions in which death occurred and its causes are given as follows:

#### Conditions

Tuberculosis.....	2
Neoplasms.....	2
Pyonephrosis.....	2
Hydronephrosis.....	1
Hæmatohydronephrosis (traumatic).....	1

#### Causes of death

Hæmorrhage.....	2
Renal insufficiency.....	1
Pyelonephritis.....	1
Sepsis.....	1
Shock (suprarenal).....	1
General debility.....	1
Tetanus.....	1

Renal insufficiency which formerly accounted for a high percentage of the deaths following operation now plays a minor rôle, but one patient in the authors' series died from uræmia. In the majority of the operations the anæsthetic employed was gas and ether. Gas and oxygen was used in 15 cases, and spinal anæsthesia in 2.

The various pathologic conditions for which nephrectomy was performed are described in detail.



Among 92 cases of tuberculosis, which formed the largest single group, there were 2 deaths. The ureter was completely excised down to the bladder in 10 per cent of the cases, the main indication for this procedure being marked stricture formation at the lower end. The majority of secondary nephrectomies (11) were performed for calculous pyonephrosis. At the first operation the kidney was drained. The neoplasms included 20 hypernephromata, 2 adenocarcinomata, and 5 mixed kidney tumors. The main indications for abdominal nephrectomy are large growths in young children. In general, the mortality of abdominal nephrectomy is very high, being 13 per cent when the operation is performed by the lumbar route and 37.5 per cent when it is done by the transperitoneal route.

The operative technique of nephrectomy is described in full. The article is concluded with a synopsis of the histories of the 8 patients who died following the operation.

**Holmes, W. R.: Retroperitoneal Perirenal Lipomata.** *J. Am. M. Ass.*, 1920, lxxv, 1065.

The author reports a very interesting case of perirenal lipoma.

M. H., a white woman, aged 43, was admitted to the Johns Hopkins Hospital, July 31, 1916, complaining of abdominal swelling, backache and pain in the right lower abdomen. This illness began two years previously with a diffuse swelling of the abdomen.

The physical examination was negative. The abdomen was symmetrically distended, resembling that of a full-term pregnancy. On palpation, it felt in every respect like an encapsulated cystic tumor. The uterus was enlarged and in retroposition. Filling the anterior vaginal vault was a soft, semifluctuant mass which seemed continuous with the mass felt in the abdomen. The cystoscopic examination was negative and the phenolsulphonephthalien secretion was normal. Roentgenoscopy revealed kinking of the sigmoid.

The abdomen was opened through the median line extending from the symphysis pubis to the xiphoid cartilage. The pelvis was first exposed. Scattered over the posterior wall of the uterus were a few small subperitoneal myomata. The abdominal tumor was evidently not of pelvic origin. On the left side the growth extended to the diaphragm, and on the right side as high as the edge of the liver. Below, it extended into the pelvis, displacing the sigmoid and pelvic peritoneum and crowding the intestines into the upper right quadrant below the liver.

In the next step of the operation an incision was made to the right of the descending colon in the posterior parietal peritoneum between the mesenteric vessels. When the peritoneum and capsule of the tumor were opened, the tumor was found to be soft, multilobular, and yellowish white, and to resemble in its gross appearance an ordinary fibrolipoma. As the growth was encapsulated and there

was a definite line of cleavage between the capsule and the tumor, enucleation of the mass was possible.

The greatest technical difficulty was encountered in avoiding injury to the mesenteric vessels which were stretched out across the surface of the growth. By the posterior enucleation of the mass the left suprarenal capsule, the pancreas, the spleen, the vena cava, and the abdominal aorta were exposed. The tumor was dissected free except in the region of the left kidney. The growth entirely encircled the left kidney which was evidently its site of origin. The kidney was therefore removed with the tumor. A small cigarette drain was inserted into the retroperitoneal space, and the abdominal incision closed in layers. The patient made an uneventful recovery.

The tumor weighed 25 lb. and was densely adherent to the capsule of the kidney.

The histologic picture varied in different parts of the mass. Sections showed that the bulk of the tumor was made up of fatty areolar tissue.

The etiology of perirenal lipomata is not known.

The author quotes Lecène who recently reviewed 113 cases collected from the literature. Eighty-eight of the patients were women, and 25, men. The youngest patient was an infant 1 year of age whose case was reported by May. The majority of the patients were between the ages of 40 and 50. The tumors develop from the fat of both kidneys with equal frequency.

The patient is first made aware of the condition by an increase in size of the abdomen. This swelling may be observed over a period of several months or years before a physician is consulted. It is because of their silent beginning that the tumors have usually attained enormous size when they are first seen by the surgeon.

The diagnosis rests on the discovery of a large, soft, abdominal tumor with a history of slow growth and a smooth rounded surface which is semifluctuant without mobility and extends into the flanks in the region of one or both kidneys. The author emphasizes the importance of a thorough cystoscopic study in all suspected cases of retroperitoneal lipoma.

The treatment of perirenal lipoma is surgical. The tumor may be approached through either a lumbar or an abdominal incision. Most surgeons advocate the abdominal route. The incision in the peritoneum should be made external and parallel to the colon. In this way the colon may be mobilized as in operations for malignant tumors of the large bowel and a ready approach to the tumor is obtained without danger of injuring the blood supply of the intestine. If the tumor is very large, it may be necessary to remove it by morcellation. Drainage of the retroperitoneal space is important and may be accomplished either transperitoneally or through a counter lumbar incision.

The prognosis of retroperitoneal perirenal lipomata is grave. Benign in appearance, these growths become dangerous because of their great size. Recurrences after operation are frequent.

THEODORE DROZDOWITZ.



## BLADDER, URETHRA, AND PENIS

**Danforth, W. C., and Corbus, B. C.: Tumors of the Bladder, Including a Report of Vegetating Syphiloma of the Bladder.** *Surg., Gynec. & Obst.*, 1920, xxxi, 219.

The author observed 7 cases in seven months, 3 cases of carcinoma, 3 of papilloma, and 1 case of condyloma of the bladder. The latter was that of a woman 25 years of age with negative findings for syphilis in other parts of the body and a negative Wassermann. Cystoscopic examination showed that the bladder floor was occupied by an infiltrating growth with many small papillomatous projections and larger rounded masses which obscured both ureteral orifices. Specimens obtained at cystotomy were found to be non-malignant and the patient began to improve immediately under specific treatment.

To date, the literature shows only 52 cases of syphilis of the bladder. It is suggested that a new division under the head of "granuloma of infective origin" be added to Kuester and Albarran's classification to include the condyloma of secondary lues and the gumma of tertiary lues.

Of the cases of neoplasm 1 was treated by cystotomy and cautery excision followed by radium; 2 by fulguration and radium; 1 by cystotomy and massive destruction by fulguration and radium; and 1 by X-ray and radium.

Trans-urethral fulguration is applicable particularly to small growths, the larger tumors being attacked best by the abdominal route. In radium therapy the radium should be placed in as close apposition to the site of the tumor as possible.

The importance of hæmaturia and pyuria as initial symptoms of bladder tumors is emphasized.

FRANK HINMAN.

**Kretschmer, H. L.: Leukoplakia of the Bladder and Ureter.** *Surg., Gynec. & Obst.*, 1920, xxxi, 325.

The author gives a most complete report of his case, including autopsy findings, and reviews the very few cases previously reported.

The condition has been designated by various terms such as metaplasia, xerosis, cholesteoma, leukoplakia, leukoplasia, and pachydermia. It should not be confused with von Hansemann's malakoplakia, a case of which was reported by Folsom at the last meeting of the American Medical Association. The latter differs from it both macroscopically and microscopically.

Kretschmer's study includes the frequency, age and sex incidence, relation to venereal infection, pathogenesis, nutrition, distribution, associated pathology, bacteriology, symptoms, cystoscopic findings, and treatment of the condition on the basis of the cases reported to date.

Treatment is divided into operative and non-operative. Non-operative treatment includes bladder irrigations and instillations, and lavage of the kidney. Operative treatment is directed not only

against the leukoplakia but also against the co-existing lesions. Calculi, if present, must be removed, and if possible plaques should be cauterized or excised. Simple suprapubic cystotomy has been advised. This was carried out in the author's case, since resection was out of the question because of the extent of the pathologic process.

Kretschmer's conclusions are as follows:

1. From the scarcity of case reports in the literature it appears that leukoplakia is a rare condition.
2. The etiology is unknown.
3. The histopathologic findings seem to be uniform and constant.
4. There is no symptom or syndrome pathognomonic of the condition.
5. Of great importance in the diagnosis is the discovery of large numbers of squamous epithelial cells in the urine and the passage of membrane or flakes of squamous epithelial cells.
6. Leukoplakia of the bladder can be recognized definitely by means of a careful cystoscopic examination.

JOHN P. O'NEIL.

**Jungano, M.: Primary Tuberculosis of the Bladder** (Tuberculose primitive de la vessie). *J. d'urolog. méd. et chir.*, 1920, x, 15.

The case reported by Jungano was that of a woman 35 years of age who had tuberculous cystitis. It was believed at first that the vesical condition was secondary to tuberculosis of the kidney. After two months of treatment of the cystitis, the neck, trigone, and lateral walls of the bladder still remained greatly congested and oedematous. The ureteral orifices, however, were normal. A superficial ulceration near the left ureteral opening suggested that the left kidney was tuberculous, but the centrifugalized urine from both kidneys was normal and guinea pigs inoculated with the urine were found free from tuberculosis. Complete and careful examination of the patient showed clearly that the bladder was the only portion of the urinary tract invaded by the disease and there were no subjective or objective symptoms denoting a pathologic condition in any other organ. Therefore the condition was proved definitely to be primary in the bladder.

Jungano reviews the literature of tuberculosis of the bladder and discusses the routes of infection. He finds that in almost all cases the vesical infection was secondary to an infection of the same nature involving other urinary organs and occasionally to tuberculosis of the genital organs. The route which the bacillus follows is almost always a descending route from the kidney through the ureter. Primary infection of the bladder, however, has been effected both by the blood route and by way of the urethra. In the author's case a clinical finding of importance was an intermittent increase in the size of the left Bartholin gland. While it is possible that this gland may have contained a focus capable of infecting the bladder through the blood, this could not be verified.

In discussing the pathologic anatomy Jungano states that the three lesions which are usually found



in tuberculosis of the bladder—granulation, ulceration and ecchymotic plaques—are not characteristic but the presence of any one of them justifies the suspicion of tuberculosis. All doubt is removed by a positive microscopic examination and inoculation tests with the urine.

The author carefully reviews the cases of primary tuberculosis of the bladder reported in the literature. The great majority of these lack definite proof. In order to obtain statistical data Jungano last year sent out inquiries to leading urologists asking if they knew of a case of primary tuberculosis of the bladder in which the renal urine was found negative as regards the Koch bacillus both by bacteriological examination and inoculation. In the many replies received there was only one in the affirmative and even in this instance there was reason to believe that the bladder may have been involved secondarily.

W. A. BRENNAN.

**Casper, L.: The Treatment of Tuberculosis of the Bladder** (Zur Behandlung der Blasentuberkulose). *Ztschr. f. Urol.*, 1920, xiv, 294.

Tuberculosis of the bladder is usually secondary to tuberculosis of the kidney. It occurs in two forms; either the entire bladder is involved or the condition is limited to circumscribed areas. In the former type the prognosis is unfavorable. After nephrectomy improvement may be expected only if contractility of the detrusor fibers is not impaired by connective-tissue degeneration. When shrinkage of the wall occurs, any treatment is practically futile. Relief may be given only by the administration of narcotics. When the condition is extreme, exclusion of the bladder alone remains. No improvement has been observed following the use of tuberculin.

The Guyon edict that a tuberculous bladder should be treated by instillations rather than irrigations still holds good today. The author does not favor the use of carbolic acid as advocated by Rovsing or the use of lactic acid. Silver nitrate is of value only for mixed infections. Subjective relief is afforded by instillations of oily solutions with or without iodoform and guaiacol. The best results are obtained by the instillation once or twice a week of between 20 and 30 ccm. of a 1:20,000 solution of bichloride of mercury. This solution should be left in the bladder and its strength should be increased gradually to 1:2,000. Another method of value is that of Hollaender who gives potassium iodide internally and a few hours later instills calomel in oil into the bladder. Casper has modified Hollaender's method by using, in addition, guaiacol which has a soothing effect on the tuberculous bladder. The instillation he recommends consists of 10 ccm. of a mixture of calomel, 2.0, guaiacol, 5.0, and sterile olive oil to make 100.0. This treatment should not be repeated more than once or twice a week and must be continued for a long time.

In one case, that of a strong young man who had had a nephrectomy ten years previously, a bladder

ulcer just below the right ureter developed three years ago. As all ordinary methods were of no avail, Casper treated the ulcer and the surrounding elevated area with diathermy in three sessions. The subjective disturbances disappeared entirely and after gradual healing over there is now in the area formerly occupied by the ulcer a smooth, light, shiny surface without blood vessels. COLMERS (Z).

**Blum, V.: Three New Cases of Successful Operation for Diverticula of the Bladder** (Drei neue Faelle von erfolgreicher Operation von Blasendivertikeln). *Ztschr. f. urol. Chir.*, 1920, v, 90.

The author reports in detail the last three cases of a series of nine which he operated upon for diverticula of the bladder. The most important and decisive diagnostic aids were found to be cystoscopy and cystography, the bladder being filled with 5 per cent collargol.

In all three cases there was a history of chronic urinary infection which resisted all methods of treatment, retention of urine, and bacteriuria, conditions which had persisted for many years.

The sites of predilection for diverticula of the bladder, especially those of the congenital variety, are the ureteral orifices and the opening of the urethra. The diverticula were found in these areas also in the author's cases.

In the treatment operation alone is to be considered. In two of the cases reported it was possible to extirpate the diverticulum by the transvesical route, once after invaginating it into the bladder and once by ligation and resection of the thin pedicle. In the third case, however, this was impossible on account of old adhesions. The diverticulum was therefore excluded and after excocleation the sac was caused to atrophy by suprapubic drainage.

The results of the operation are very good. In the author's nine cases a complete cure resulted in seven and a recurrence developed in one. In the remaining case death resulted after six months from chronic pyelonephritis. Autopsy showed, however, that the ureter which had been re-implanted into the bladder had been functioning normally.

VOLLHARDT (Z).

**Pauchet, V., and Butler d'Ormond, R.: The Treatment of Diverticula of the Bladder** (Diverticules de la vessie; traitement). *J. d'urol. méd. et chir.*, 1920, x, 1.

The authors treated a recent case of diverticulum of the bladder by invagination as follows:

1. The bladder was exposed by a suprapubic incision.
2. The diverticulum was exposed by subperitoneal liberation of the bladder.
3. The bladder was opened, the external surface being protected to prevent infection and pelvic cellulitis.
4. Three calculi found in the diverticulum were removed and the diverticular cavity was washed with ether and filled with etherized gauze. The



vesical cavity was then cleansed again and the diverticulum liberated as far as possible in order that it might be inverted.

5. The diverticulum was inverted into the bladder with the gloved finger and fixed to the base of the bladder by three catgut sutures.

6. A suture was placed also on the external surface of the bladder to fix the inverted diverticulum, and the wound in the bladder was fixed to the abdominal wall as after a prostatectomy.

7. A Marion tube was inserted.

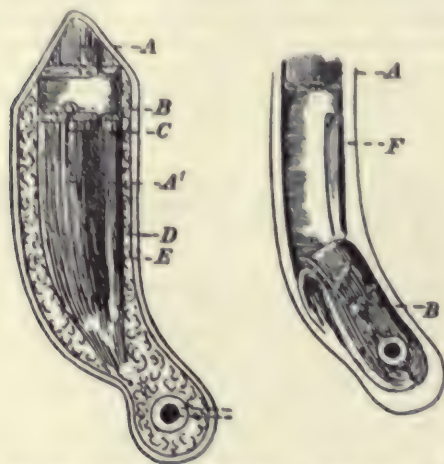
Following this operation a small fistula persisted which the authors will soon close. The patient's condition is good.

W. A. BRENNAN.

**Thompson, R.: The Operative Treatment of Congenital Deformities of the Lower Urinary Tract, with Special Reference to the Formation of a "Compressor Urethra."** *Lancet*, 1920, cxcix, 700.

The author reviews a number of cases operated on for malformations of the lower genito-urinary tract. One patient with epispadias and no urethral sphincter had constant dribbling. On account of its location and convenient nerve and arterial supply, the lower part of the right rectus muscle was used to construct a compressor urethra muscle. This portion of the muscle was turned down, split, and placed around the orifice (See Fig.). The muscle is constantly in action, but may be released quite readily. The operation was satisfactory. Four months later the patient was able to control urination.

In a second case, a case of congenital extrophy of the bladder, the mucous edges were carefully dissected up, turned inward, and united without tension. The raw edges left after the dissection were approximated with Lembert sutures. The author



A, Upper end of divided rectus. A', Lower portion divided rectus. B, Deep epigastric artery. C, Rectus longitudinally split. D, Superficial fascia. E, Inner portion of rectus.

holds that these sutures are essential to the success of the operation. They bury deeply the main structures concerned and protect the buried line of sutures from sepsis. Thompson contemplates the construction of a compressor urethra muscle for this patient similar to that formed in the first case.

A case of hypospadias is cited and an operation for this condition is described. By means of skin flaps a urethra is constructed which is buried deeply by Lembert sutures applied to the subcutaneous tissues on each side.

A. J. SCHOLL, JR.

## GENITAL ORGANS

**Wildbolz, H.: The Treatment of Tuberculous Epididymitis** (Ueber die Behandlung der tuberkulösen Epididymitis). *Schweiz. med. Wchnschr.*, 1920, I, 506.

Tuberculous epididymitis is bilateral in from 50 to 75 per cent of all untreated cases (Koenig, von Bruns). This percentage is lowered to 30 per cent by unilateral castration. Bilateral castration in bilateral involvement results in a cure in 80 per cent of the cases of genital tuberculosis, clearing up even seminal vesicle and prostate involvement (Ansuetz). When used to prevent the marked symptoms of castration in youth conservative methods such as Bier's hyperæmia, local applications of iodine or naphtha, salt baths, and sulphur baths are as unsatisfactory as injections of tuberculin. That the frequent retrogression of tuberculous epididymitis observed even in the lower classes is only an apparent retrogression has been proved by the pathologic-anatomic studies of Simmonds. Spontaneous cure practically never occurs.

Rollier reports that of 9 cases 7 were cured and 2 improved by heliotherapy. Wildbolz examined histologically 13 cases of tuberculous epididymitis which had been under treatment by heliotherapy for periods varying from eight months to seven years and found that in the majority there was not a trace of healing. Marked fibrosis was present in only 3 cases in which the treatment had been continued for periods of seven years, one and one-half years, and eight months respectively.

Rollier combines heliotherapy with cauterization as recommended by Velpeau in 1851 and with X-ray therapy. As heliotherapy must be continued for at least one or two years and does not improve the function of the organ or prevent the spread of the infection in the urogenital tract the author recommends epididymectomy. The danger of miliary dissemination following this method is not great if care is taken to prevent undue trauma during the operation. Of 88 patients on whom Wildbolz performed 72 epididymectomies 3 died of meningitis several months after the operation. The adjacent testicle became affected in only 1 of the 72 cases. In 5 cases small tubercles observed at the site of the resection were treated with the thermocautery.

Epididymectomy has the same favorable effect upon the foci in the seminal vesicles and prostate as



castration. In 15 per cent of the author's cases the other epididymis became involved later. Involvement of the testicle contra-indicates epididymectomy.

In the diagnosis of doubtful cases the author employs his intracutaneous "own urine" test. For the after-treatment injections of tuberculin and heliotherapy are advocated. If the vas is not involved Henschen sutures its stump into the testicle (physiological epididymectomy). JASTRAM (Z).

**Dorn, J.: Chronic Non-Specific Epididymitis** (Die chronische, nicht spezifische Epididymitis). *Beitr. z. klin. Chir.*, 1920, CXX, 25.

Dorn reports a number of cases of chronic epididymitis treated in the Garré clinic which clinically appeared to be due to tuberculosis but upon microscopic examination were found to be non-tuberculous. In cases of this kind the epididymis is thickened and enlarged and there may or may not be breaking-down of tissue. In cases in which the tissue had been broken down small yellow foci the size of a pea, hazelnut, or cherry were found. Some of these were suppurating and others had formed cavities with a definite brown wall. In a few cases multiple caseated foci were present. Microscopically there was no evidence of tuberculosis, the only findings being chronic inflammation, proliferation of connective tissue, proliferation and thickening of interstitial tissue with round-cell infiltration, the formation of granulation tissue, and partly suppurative softening.

In several instances staphylococci were discovered. These had entered through small furuncles, slight injuries, etc. They were recovered also from the urethra, the prostate, and the urine, although they had not caused local injury or symptoms. As the urine was entirely normal except for a few leucocytes, it appeared evident that the bacteria were of low grade and had passed the kidneys without injuring them. In their descent they gained entrance to the epididymis and there produced a chronic inflammation. The inflammatory process is to be considered the manifestation of general chronic staphylococcic sepsis with a clinical picture similar to that of tuberculosis. For this reason tuberculosis may be erroneously suspected.

In regard to the treatment the author states that in all doubtful cases a section should be removed for microscopic examination before a radical operation such as hemicastriation is performed.

BODE (Z).

**Lewis, B., and Moore, N. S.: Non-Hypertrophic Forms of Prostatic Obstructions.** *South. M. J.*, 1920, xiii, 740.

Non-hypertrophic obstruction at the bladder neck is a definite pathologic condition which may appear at any age but most commonly develops in later life. The diagnosis is not difficult if a systematic examination is made and particularly an examination with the cystoscope.

In the authors' cases the etiology was obscure. The ages of their patients varied from 3 to 64 years. The condition became aggravated during the winter and early spring and in some cases had persisted for many years. Mode of life, infection, etc. were of little, if any, importance as etiological factors. In every instance complaint was made of frequency of urination which was usually accompanied by pain. The stream was small and sluggish, and often cut off abruptly. The amount of residual urine varied up to complete retention. All of the older patients gave signs of absorption of toxins from retained urine, whether it was decomposed or not.

On rectal palpation it was found that the prostate was not enlarged, at times being even smaller than normal and that it was uniform in outline and not tender. Cystoscopy failed to reveal any intravesical enlargement, but showed a definite ring of tissue surrounding the bladder neck. Inflammation, changes in the bladder wall, such as trabeculation, diverticula, etc., were noted, their character being dependent upon the time the condition had been present.

The treatment consisted in dividing the bar, dam, or stricture with as little injury as possible to the neighboring parts. This was done with the high-frequency fulguration cautery, a small wire cable with a knife-shaped electrode on its distal end being passed through the cystoscope. If necessary, the operation was repeated a week later, the urethra being dilated once or twice with the Kollmann dilator.

The article includes a number of interesting case reports. JOHN P. O'NEIL.

**Jones, J. F. X.: Views on Surgery of the Prostate.** *N. York M. J.*, 1920, cxii, 486.

The most important phase of the question of prostatic surgery is the proper selection of cases for operation.

As to the manner of removing the prostate, it is becoming more and more apparent that the surgeon must use a method to fit the case rather than attempt to make the case fit the method. While the suprapubic operation has given wonderful results in the hands of Freyer, its masterful exponent, and while the perineal method, when performed by its most able advocate, Young, has shown a surprisingly low mortality, the surgeon who limits himself to either method exclusively cannot help, sooner or later, doing an injustice to his patient. If the operation has not been selected with due regard to the position and size of the enlarged gland, incontinence of urine or a recto-urethral fistula may follow either method.

The small fibrous gland should not be removed suprapubically; the large soft gland which projects into the bladder should be removed suprapubically. If the abdomen is thick and the bladder small, the perineal prostatectomy is the safer method. When the gland is not palpable per rectum, but presents symptoms and is found to be enlarged on



cystoscopic examination, the suprapubic prostatectomy is the better method.

Cunningham believes that "those professing to be expert in prostatic surgery should possess a skill in performing the different proved operations and should have the ability to select the most appropriate operation for the individual, not employing a single operative technique for all patients." DaCosta says, "No one routine plan is suitable in all cases. The patient should be studied, and the operation chosen which is safest and best for that individual patient. The surgeon who uses one method only must wrong many patients and he retains consistency at the expense of humanity."

Young's punch operation, originally recommended for obstruction of the vesical neck by medium bar (Randall) sclerosis of the vesical neck, and intravesical or intra-urethral isolated prostatic lobules, should be limited, according to Braasch "to cases in which the superficial medium tissues obstruct the vesical orifice, and to occasional cases of involvement of the bilateral lobes in which enucleation is otherwise inadvisable." According to Judd, it is an operation which requires considerable skill. In some cases it may be followed by bleeding, necessitating other operations. Prostatomy by the Bottini or Chetwood method should be employed in the cases of old and enfeebled subjects who cannot endure catheter life or withstand a prostatectomy. Bouffleur performs a galvanocautery operation through a suprapubic cystotomy incision, the actual cautery having been heated to a white heat. Small median-lobe enlargements of the prostate have been treated successfully through the cystoscope by means of the Oudin current.

With the exception of cases of absolute retention in which catheterization is impossible and which may be treated by making a very small suprapubic opening into the bladder to allow gradual drainage through a female, self-retaining catheter, there is always ample time for the careful study of cases of prostatism.

It is important, first of all, to make a diagnosis. When a patient of middle age or over complains of nocturnal irregularities of urination, hypertrophy of the prostate, urethral stricture, and cancer of the prostate should be taken into consideration. Growths within the bladder may be differentiated by means of the cystoscope. The cystoscope will reveal the presence of stone and often give information as to the shape and size of the prostate.

In these cases a knowledge of the functional capacity of the kidneys is essential. Of the various tests of renal function, the indigo-carmin and the phenolsulphonaphthalein tests are the most practical.

A twenty-four-hour specimen of urine should be collected. If the total quantity is between 1,000 and 2,000 c. cm. it may be considered normal. Oliguria and polyuria are significant of so many conditions, surgical and non-surgical, that either symptom is important only when associated with other pathognomonic signs.

In the differential diagnosis of prostatic conditions perhaps nothing is more puzzling than a case in which there is retention of urine but no palpable enlargement of the gland and no stricture. In such a case the condition may be due to carcinoma, nodules, an indurated posterior lobe, a pedunculated middle lobe, or the presence of a bar, all of which will be revealed by the cystoscope. Paralysis of the bladder is another possibility. If the bladder is paralyzed, cystoscopic and urethroscopic examination may show typical trabeculation and perhaps some relaxation of the sphincters. Rectal examination will be either negative or reveal a prostate which seems smaller than normal and is surrounded by flabby tissues. The cerebrospinal fluid will probably be positive to the Wassermann test, there may be lessening or absence of sensation in the deep muscles. Judd and Braasch state that in such cases of tabes where it is evident that the sphincter itself is not relaxed (and this, Jones states, may be noted through the cystoscope), that hypertrophy of the prostate is sufficient to account for the urinary obstruction, and the general condition is favorable, prostatectomy may be attempted.

In young men prostatic sclerosis which is negative to rectal and cystoscopic examination has been observed but this condition is rare. Tabes must be carefully excluded, however, before such a diagnosis is made. Judd believes that many of the patients with prostatic trouble who continue to have so-called cystitis and residual urine after the obstruction has been removed are in reality suffering from diverticula.

Acting on the acknowledged fact that patients with prostatic conditions who have cystitis and other evidence of chronic infection at the time of operation usually progress better than those who have no symptoms of infection, Judd tried the use of the colon bacillus to modify infection in prostatectomies. His results were suggestive but further investigation on a large scale is necessary before conclusions may be drawn. Cultures of the urine should be made in all cases of prostatism.

Before operation the bladder should be drained—through the urethra, if possible, otherwise suprapubically—until the patient's local and general condition warrants prostatectomy.

In addition to the drainage tube in the bladder after suprapubic prostatectomy, a cigarette drain should be placed in the prevesical space; moreover, the use of Dakin's solution and the Carrel technique in the space of Retzius as suggested by Judd seems advisable. In Judd's opinion, irrigation should be delayed until after the first day following the operation. Irrigation immediately after a suprapubic prostatectomy prolongs oozing.

The mortality of prostatectomy in the hands of the average general surgeon has been approximately 50 per cent. Its reduction will depend upon:

1. Intimate association of the internist, physiologist, and laboratory technician with the surgeon in the study of cases.



2. Thorough examination of the patient by one skilled in physical diagnosis, particular stress being laid upon the lungs, heart, arteries, kidneys, and nervous system.

3. Complete investigation of the blood and urine by a competent laboratory analyst.

4. Willingness and ability on the part of the surgeon to adapt his methods to the special requirements of each case, irrespective of his preferences as regards technique.

THEODORE DROZDOWITZ.

**Orth, O.: Perineal Versus Suprapubic Prostatectomy** (Ischiorectale oder suprapubische Prostataktomie?). *Ztschr. f. urol. Chir.*, 1920, v, 101.

The perineal prostatectomy is superior to other methods. Its mortality varies between 3 and 4.7 per cent while that of the suprapubic operation is between 10 to 22 per cent and that of the old perineal operation between 8 and 9 per cent. In the suprapubic and old perineal operations it is impossible to obtain perfect hæmostasis and protection of the wound. For the induction of hæmostasis the surgeon is dependent upon tamponade which is not always effective. The constant oozing of blood and urine prevents the firm adhesion of the tampon and when the bladder is left entirely or partially open thorough contraction of the vesical wall is inhibited. The difficulty of protecting the wound may lead to general infection by two routes: from the bed of the prostate by way of the lymphatics into the veins, or ascending through the renal pelvis into the kidney and from there into the circulation.

The perineal method of Voelcker gives a clear view of the operative field during every step of the operation. Therefore it is possible to secure good hæmostasis and to suture the capsule so that at least for a few days the surrounding tissues are protected against the infiltration of urine. In cases operated on by the suprapubic route there is frequently considerable residual urine. This method also disturbs the anatomical structure and injures the expulsive power of the bladder. The perineal route prevents such damage. Inflammation of the testicle may follow any method and is due probably to injury of the seminal vesicles. Possibly this may be prevented by ligating the vasa deferentia in the operative field.

On the basis of his own successful results the author recommends early operation.

RAESCHKE (Z).

#### MISCELLANEOUS

**Crossan, E. T.: Spermatocoele.** *Ann. Surg.*, 1920, lxxii, 500.

By the term "spermatocoele" is meant today a retention cyst of the scrotum containing spermatozoa and arising from the vasa efferentia, the canal of the epididymis, or the embryonic remnants about the testicle and lower end of the cord.

The author reviews the literature on the subject. The first use of the term "spermatocoele" is credited

to Guérin who, in 1785, applied it to an obscure inflammatory condition of the testicle which in no way resembled the condition known as spermatocoele today. Most of the study of spermatocoeles is credited to the French and Germans, the American literature on the subject being very scanty.

Crossan describes the anatomy and embryology of the testes and epididymis. Liston regarded spermatocoeles as enlarged seminal tubules. Curling, Broca, and Paget advanced the theory that they are neoformations. Follen and Verneuil claimed them to be remnants of the wolffian body. The first to suggest that they are retention cysts was Virchow. Virchow held that spermatocoeles arise only from the vasa efferentia and the organ of Giralde, while Kocher contended that their constant site is the vasa efferentia. Hochenegg who found the width of the semeniferous tubules to be between 0.1 and 0.2 mm., confirmed Kocher. Dolbeau produced dilatation of the vasa efferentia in one hundred testicles by injecting mercury. Summing up, it may be said that spermatocoeles arise most frequently from the vasa efferentia and vas aberrans superior, often from the sessile hydatid, and only occasionally from the vas deferens, pedunculated hydatid, and organ of Giralde.

Three causes to which the condition has been ascribed are trauma, sexual abstinence, and gonorrhœa. Trauma seems the most logical. Von Hoffman divides spermatocoeles into two groups, extravaginal and intravaginal, though he claims that most extravaginal cysts begin as intravaginal cysts.

The author discusses the symptoms, both subjective and objective, the pathology, the diagnosis, and the treatment. The treatment is radical as aspiration, the injection of irritants, and incision are frequently followed by recurrence. In the treatment of cysts arising from the sessile hydatid and the vasa efferentia it is necessary to remove a portion of the tunica albuginea, and cover the defects with serosa. The other varieties of cysts may be easily enucleated from their beds and their stalks ligated close to their bases. If the testicle is atrophied, castration is the logical procedure.

The chief symptom is swelling. Occasionally a history of trauma is given.

JOHN P. O'NEIL.

**Thompson, L.: Syphilis of the Genital Organs of the Male and the Urinary Organs. IV.** *Am. J. Syphilis*, 1920, iv, 706.

Chancre occurring on the scrotum usually begins as a small red circular spot which gradually increases in size. Soon desquamation of the superficial epithelium begins and small cracks occur which form a circular ulcer. The latter is usually shallow and indurated.

The macular syphiloderma are rarely observed on the scrotum, but the lenticular papules, both the dry and the moist, particularly the latter, are very common, and the gummatous syphiloderm is observed very often.



Luetic orchitis was apparently not recognized until 1736 when Astruc differentiated venereal tumors of the testicle which responded to treatment by mercury and those which did not. The author quotes from literature Benjamin Bell, Sir Astley Cooper, and Ricord.

Syphilis of the testicle is one of the most frequent manifestations of the disease. Warthin found varying degrees of atrophy and fibrosis in the testis of all cases of syphilis in males which came to autopsy.

Syphilis of the testicle occurs in two forms, interstitial or fibrinous orchitis and gummata. The interstitial type is usually of earlier occurrence than the gummatous type, being observed as a rule during the first three or four years.

The condition may be bilateral, although more frequently it is unilateral. Histologically the process consists of an infiltration of lymphocytes and plasma cells between the tubules, proliferation of the fibroblasts of the stroma, thickening of the basement membrane, and diminished spermatogenesis. *Spirochætæ* may usually be demonstrated early in the process.

Gummata of the testicle are rarely bilateral and occur as firm nodules of varying size, either single or multiple, enclosed in fibrous tissue. Histologically the typical gummatous areas are surrounded by a vascular layer of delicate, fibroblastic proliferation of the stroma with considerable lymphocytic infiltration. Remains of the semeniferous tubules are observed between the gummatous areas.

Interstitial orchitis is of insidious onset. On palpation the testicle is found of a very hard wooden consistency. Rarely the development is more rapid and associated with considerable swelling, pain, tenderness on palpation, redness, and œdema of the organ.

Gummata of the testicle as a rule give rise to few if any subjective symptoms. Palpation reveals either a smooth or nodular enlargement, more frequently the latter.

Interstitial orchitis may be mistaken for orchitis due to trauma, gonorrhœal orchitis, or epididymitis.

Gummata of the testicle must be differentiated from tuberculosis and new growth.

Syphilis of the testicle may be arrested in the majority of cases. The prognosis as to function, however, is not so favorable, but depends entirely upon the extent of the process.

The treatment of syphilis of the testicle is mainly specific. Arspenamine, mercury, and one of the iodides should be pushed vigorously.

The author quotes a number of authorities between 1736 and 1863 who first called particular attention to syphilis of the epididymis. Thompson reported 16 cases, in 14 of which the epididymis alone was involved to the exclusion of the testicle. Thompson's record of 276 syphilitics gives a total of six cases of involvement of the epididymis. Balme saw 13 cases among 2,300 syphilitics.

Syphilis of the epididymis occurs in three forms, an acute and a chronic interstitial epididymitis and gummata.

The acute interstitial variety may occur as early as the second month following infection (Zcissl) but as a rule is of later occurrence. The swelling of the organ begins in the globus major and consists largely of an infiltration of lymphocytes and plasma cells with hyperplasia of the fixed elements. A certain degree of hydrocele usually develops.

The chronic variety of interstitial epididymitis may follow the acute variety or develop without such an attack. It is of somewhat later occurrence, rarely being seen before the third year of the disease.

Gummata of the epididymis occur as a rule much later in the course of the disease than interstitial syphilitic epididymitis.

These lesions are usually multiple, rarely bilateral, and vary in size from that of a pea to that of a hazelnut.

As with the other types of syphilis of the epididymis, the histologic picture of gummata has not been described. Langhans, however, who observed the gross section of a gumma of the epididymis post-mortem, stated that it was a solid, caseous knot of angular, ramified shape about 1 cm. in diameter with a small transparent zone along the edges.

Acute syphilitic epididymitis usually begins rather suddenly with more or less severe pain and great tenderness to pressure. Later, distinct indurated areas are palpable, and in a few days the acute symptoms subside and a chronic course begins.

Chronic syphilitic epididymitis is of slow, insidious development and is usually without pain. Palpation in the beginning reveals the epididymis hard and elastic. Later it develops a board-like hardness and an irregular surface. When the fluid in the tunica vaginalis is of considerable amount, it may entirely mask the condition of the epididymis and lead to a diagnosis of simple hydrocele.

Gummata of the epididymis also are of insidious development. Palpation reveals one or more tumors. There are no subjective symptoms.

Practically the only condition from which acute syphilitic epididymitis must be differentiated is gonorrhœal epididymitis.

Chronic interstitial epididymitis due to syphilis may be mistaken for gonorrhœal epididymitis or tuberculous epididymitis.

Gummata of the epididymis may be mistaken for tuberculosis or new growth.

Finally it may be said that in the diagnosis of syphilis of the epididymis the history, the presence or absence of other manifestations of syphilis, including the Wassermann test, and the result of antiluetic therapy are probably of more importance than the findings in the epididymis itself.

The prognosis of syphilis of the epididymis is favorable as most cases clear up rapidly under specific therapy.

The treatment of syphilis of the epididymis is the same as that of syphilis of the testicle proper.



Syphilis of the spermatic cord is undoubtedly rare. A careful search of the literature revealed only 13 case reports. The length of time before it develops following syphilitic infection as reported in the literature varies from six months to nine years.

The gross pathologic condition in all of the cases was enlargement. The size varied from mere "thickening" to a tumor as large as two fists.

The length of time required for the development of the condition is recorded in only 2 cases, in one of which (Lhomeur) it was two months, and in the other (Lancersauc) five years.

Syphilis of the spermatic cord must be differentiated from other tumors of this organ, such as fibromata, sarcomata, and lipomata, and from tuberculosis.

The prognosis of syphilis of the spermatic cord is good under specific therapy. The treatment is entirely specific.

That the seminal vesicles may be involved in the syphilitic process has never been shown, but undoubtedly if the seminal vesicles of all syphilitics who come to autopsy were carefully examined, evidence of such involvement would be found in some cases.

THEODORE DROZDOWITZ.

**Peacock, A. H. : The Surgical Treatment of Urinary Tuberculosis.** *Northwest Med.*, 1920, xix, 235.

Peacock directs attention to the fact that all tuberculous infection is acquired primarily by inhalation or ingestion, and that the treatment of urological infection has two phases, surgical treatment and postoperative hygienic management.

As a rule tuberculous epididymitis is painless at first, insidious in onset, and unilateral. Later it is followed in some instances by abscess formation with rupture through the skin and the formation of a discharging sinus. If the epididymis alone is

involved, its removal is all that is indicated although it is sometimes necessary to do a castration. When this focus of infection is removed lesions of the prostate and seminal vesicle often improve.

The tuberculous prostate and seminal vesicles are inaccessible to surgical removal, and in such infections the bladder also is involved. In cases of tuberculous prostatic abscess Peacock suggests suprapubic cystotomy with abscess drainage into the bladder. This may be done under local or light general anaesthesia. Placing the bladder at rest and diverting the urinary stream reduces the oedema of the prostatic urethra, allows ulcers to heal, and affords immediate relief.

In citing an instance of primary urogenital tuberculosis of the bladder Peacock states that bladder involvement is usually secondary to renal, prostatic, or seminal vesicle infection.

Tuberculosis of the ureters is frequently the cause of prolonged suppuration following nephrectomy.

The examination of catheterized specimens from the ureters for tubercle bacilli the author considers much more satisfactory than animal inoculation.

When nephrectomy is done for renal tuberculosis the ureter is removed down to the pelvic brim and the stump is not treated. Rubber-tube drainage is used. The high temperature which usually follows such operative procedures is due to the absorption of tuberculous exudate by the large wound surface.

In bilateral renal tuberculosis keen judgment is necessary as very few cases should be operated upon, even in the presence of marked involvement of one side and only slight involvement of the other.

The operation is only a small portion of the treatment of any case of urogenital tuberculosis. It should be followed by rest, care in a sanatorium, sunlight, forced feeding, tonics, tuberculin, and residence in climatic areas found beneficial to tuberculous infections.

HARRY CULVER.



## SURGERY OF THE EYE AND EAR

### EYE

**Wheeler, J. M.:** The Restoration of the Margin and Neighboring Portion of the Eyelid by a Free Graft from the Lower Part of the Eyebrow and the Skin Directly Below It. *J. Am. M. Ass.*, 1920, lxxv, 1055.

The case reported was a very severe burn of the eye caused by hot lead. As a result the edges of the lids and the eyeball sloughed away. Fifteen months later the lids were restored by means of large grafts, including some of the hairs, taken from the upper lid close beneath the eyebrow. These having been put in place and sutured, firm pressure was maintained for five days before the wound was redressed. After both upper and lower lids were thus operated upon and the cul-de-sacs were restored, fat was implanted into the orbit. The result was very satisfactory. T. D. ALLEN.

**Colombo, G. L.:** Some Traumatismis of the Ocular Structures and Their Treatment (Di alcuni traumatismi degli annessi oculari e del loro trattamento). *Arch. ital. di chir.*, 1920, ii, 310.

The author gives a number of case histories of ocular lesions most of which were observed during the recent war. These lesions included palpebral and tegumental injuries, comminuted fractures of the orbital walls and margins, and orbital injuries associated with the presence of definite foreign bodies in the orbit. He discusses also the treatment of purulent sinusitis following injury, direct traumatic section of the optic nerve, and plastic operations on the lids.

The general rule of immediately opening up, disinfecting, and clearing the track of a projectile, which was followed during the war, is not always applicable to orbital injuries as the percentage of such wounds which are infected is low and opening the orbital tissues may be the cause of a severe reaction, exophthalmos, and cicatricial retraction impeding the functioning of the muscles of the eye. Colombo therefore discusses only the advisability of immediate intervention or non-intervention, and does not deal with injuries which involve the eyeball itself.

Suture and reconstruction of the eyelid are indicated when the tissues are still present, but when the destruction is extensive and deep and the eyeball is irreparably injured, expectant treatment is preferable.

In fractures of the walls and margins of the orbit, operation is imperative when the destruction is extensive or there are lacerations of the eyeball or perforations of the sinuses. Sequestra are rarely formed, however, and the absence of infection is one

of the most important characteristics of injuries of the orbit.

The orbital tissues are very tolerant toward small metallic foreign bodies. When intervention is necessary in the absence of extensive fractures or foreign bodies deeply embedded in the orbit, textbooks recommend Kroenlein's operation, but in nine cases the author succeeded in extracting deeply embedded foreign bodies by means of a low conjunctival incision. This method, however, should not be used if more than eight or ten days have elapsed since the injury.

When a foreign body has penetrated the orbit through a sinus the method of treatment may be: (1) expectant; (2) enucleation and removal of bone fragments and foreign bodies; and (3) enlargement of the osseous breach, ample opening of the sinus, and cleansing of the wound, the eyeball being conveniently displaced during the operation. The author finds the last method the best.

Colombo treats purulent sinusitis by disinfecting with tincture of iodine.

Plastic operations on the eyelid may be performed after a suitable interval with pedicled skin strips from neighboring areas. W. A. BRENNAN.

**Sleight, R. D., and Haughey, W.:** The Technique of Gifford's Operation for Destroying the Lachrymal Sac. *J. Michigan State M. Soc.*, 1920, xix, 451.

Sleight and Haughey describe the technique of Gifford's operation for destroying the lachrymal sac by means of liquid trichloroacetic acid instilled into the sac through the usual incision made for its enucleation. Anæsthesia is induced with 1 per cent novocaine. The wound is packed with narrow strips of gauze. As a rule no sutures are used.

The authors obtained excellent results with this procedure in 10 cases, 2 of which they report in detail. F. P. SCHUSTER.

**Franklin, W. S., and Cordes, F. C.:** Radium for Cataract. *Am. J. Ophth.*, 1920, iii, 643.

The authors treated thirty-one cases of cataract with radium. The vision was improved in 84.3 per cent. In most cases the improvement recorded was one or two lines but in one instance the vision went from 0.5 to 1.2 and in a few others there was an improvement of 3 lines. These patients were given 10 milligram hours twice a week for four weeks and then once weekly until the process became stationary. Subsequently one exposure was given each month.

The authors conclude that radium does not injure the normal structures of the eye and has apparently a selective action on the lens. In the treatment of



incipient cataracts it is of proven value. While in many cases it is impossible to bring the vision up to normal, the result of the treatment is better than an aphacic eye and the patient is not subjected to the risk of operation. The authors admit, however, that their patients have not been under treatment for a sufficient length of time to warrant a conclusion as to whether or not the cataracts will go on to maturity.

W. F. MONCREIFF.

**O'Connor, R.: The Safest Method of Cataract Extraction.** *Am. J. Ophth.*, 1920, iii, 726.

O'Connor opens his paper with the statement that he is attacking the Smith-Indian operation because it may be attended by complications which rarely follow a preliminary iridectomy and subsequent capsulotomy and extraction performed in the usual way. Typical cases reported by those advocating the Smith-Indian method are cited and contrasted with some of the author's own cases as regards visual acuity and the percentage of excellent, good, fair, and poor results. O'Connor concludes his article with the sentence: "Their record betters mine only in the percentage of 20/15 cases, but it is quite apparent that this unimportant gain was purchased at the expense of a large number of losses."

T. D. ALLEN.

**Stark, H. H.: The Diagnosis of Chronic Intra-Ocular Tuberculosis.** *J. Am. M. Ass.*, 1920, lxxv, 923.

Stark reviews intra-ocular tuberculosis in defense of those who make diagnoses of this condition frequently.

The microscopic pathology has the same general appearance as tuberculosis elsewhere in the body and the presence of tubercle bacilli is not necessary to warrant a diagnosis. It is probable that tuberculosis is spread to the eye most frequently by way of the veins.

The clinical picture is described. A history of local injury or a focus of infection is frequently obtained. Three cases are cited.

The clinical factors of special diagnostic importance in the sclera, cornea, iris, ciliary body, retina, choroid, vitreous, and optic nerve are discussed.

Subcutaneous tuberculin injections are of value in completing the case record. Cases of tuberculosis are divided into four classes:

1. Case of active tuberculosis in the lungs. No tuberculin is given.
2. Cases of recent tuberculous activity in the lungs. An initial diagnostic and therapeutic dose of 1/500,000 mg. of tuberculin is given and then doubled until a reaction occurs.
3. Cases in which tuberculous activity was present several years before. Tuberculin is given, beginning with a dose of 1/10,000 mg.
4. Cases in which there is no history of tuberculosis at any time. An initial dose varying from 1/2 to 1 mg. of tuberculin is followed by doses of from

3 to 5 mg. every forty-eight hours until the point of saturation is reached.

Undoubtedly focal reaction is the result of a specific protein reaction and failures in treatment are due to the fact that the patient is not brought to the point of saturation. Favorable reaction to tuberculin treatment is a valuable diagnostic sign.

F. P. SCHUSTER.

## EAR

**Fraser, J. S.: Tumors of the Eighth Nerve.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Otol., 109.

The author discusses this subject from the otological aspect, urging that the diagnosis be made in the "early or otological" stage rather than in "late neurological or general surgical" stage.

Three cases in which the ears were examined microscopically are reported, the findings being described in detail.

The clinical history of a typical case may be divided into three stages: (1) the initial or "otological" stage with auditory and vestibular symptoms followed by headache; (2) the intermediate or "neurological" stage, with involvement of other cranial nerves, pressure symptoms, and "cerebellar seizures;" and (3) the terminal stage.

The author states that if solitary tumors of the eighth nerve are to be diagnosed early it is of the utmost importance that otologists thoroughly examine all cases of unilateral nerve deafness. The following conditions may simulate unilateral eighth-nerve tumors:

1. Acquired syphilitic neurolabyrinthitis. In this condition the history of syphilitic infection and the Wassermann reaction of the blood and cerebrospinal fluid are the important considerations.

2. Neuritis of the cochlear or vestibular divisions or both due to (1) exposure to cold wind; (2) toxæmia in cases of pyorrhæa alveolaris, chronic tonsillitis or appendicitis; or (3) quinine, salicylate, arsenical, or other forms of poisoning. A carefully taken history of the case and a thorough physical examination should be sufficient for the differential diagnosis. Complete deafness and total loss of the vestibular reaction are not present in these conditions.

3. Hæmorrhage into the labyrinth in the bleeding diseases. The latter may be eliminated in the differential diagnosis by a blood examination.

4. Senile or arteriosclerotic nerve deafness. This is bilateral, and as a rule is not accompanied by giddiness. The low tones are retained along with the vestibular reactions.

5. Unilateral congenital deafness. Deafness of this type is rare and not associated with giddiness or nystagmus. The vestibular reaction is present.

6. Circumscribed labyrinthitis and labyrinth fistula. These are of course associated with otitis media and usually with cholesteatoma.

7. Recent diffuse labyrinthitis. The differentiation of this condition from tumor of the auditory



nerve is not apt to be very difficult as the history and progress of the case differ distinctly and the galvanic test is of value in the diagnosis.

8. Otosclerosis. This condition is occasionally associated with giddiness, but functional examination of the cochlear and vestibular apparatus will clear up the difficulty.

9. Serous meningitis in the lateral cistern (Barany's syndrome). In this condition a history of otitis media is given as a rule and there is a well-marked pointing error which is not usually found in cases of acoustic tumor. In the majority of cases lumbar puncture results in improvement and is followed by a return of normal caloric reaction.

Reviewing the literature, the author quotes at length from various authors and summarizes their views under the following headings: etiology; pathology; histology and development of the tumors; pathologic changes in the labyrinth; symptoms; examination of the cochlear and vestibular apparatus; differential diagnosis; prognosis; and treatment.

O. M. ROTT.

**Perkins, C. E.: Sixth Nerve Involvement in Purulent Otitis Media.** *Laryngoscope*, 1920, xxx, 666.

The author reports two cases of sixth-nerve involvement in purulent otitis media, the first an ordinary case of the Gradenigo syndrome appearing after the mastoid operation, and the second a case in which a retropharyngeal abscess was present. When this occurs, it demonstrates positively that the suppurative process has invaded the petrous

tip and broken through the lower surface of the bone. Its approach to the upper surface is shown by involvement of the gasserian ganglion which results in neuralgia, and of the sixth nerve, which results in disturbance of function of the external rectus oculi.

The gasserian ganglion lies in much closer relation to the air cells occupying the petrous tip than the sixth nerve. In infective processes extending to such cells it would be expected that the ganglion would become involved sooner and more frequently than the sixth nerve. It undoubtedly does become involved sooner. The reason the sixth nerve does not escape oftener is that, as it passes over the petrous portion, it is encased in a more or less unyielding canal (Dorello's canal) the walls of which, when swollen, cause pressure and disturbance of function.

Notwithstanding this anatomical arrangement, which makes the nerve more vulnerable, there may be a disturbance of the gasserian ganglion without an abducens paralysis. Therefore trigeminal neuralgia, otherwise unaccounted for, which occurs on the side of a suppurative middle-ear process should direct attention to the probability that the infection has extended to the labyrinth.

The author observes that, given a suppurative middle-ear process caused by the streptococcus capsulatus and associated with a sclerotic mastoid process, one may expect the condition to extend inward if the anatomical arrangement is at all favorable. Under these circumstances, a cell in the petrous tip has very little chance of escape.

O. M. ROTT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Watson-Williams, P.: Latent Sinusitis in Children.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Laryngol., 228.

The symptoms of chronic latent sinusitis in children are essentially similar to those of infected tonsils and adenoids, viz., a recurrent nasal catarrh, buccal respiration, catarrhal deafness, aprosexia, mental backwardness, and chronic sepsis. In infection of the sphenoidal sinus especially other manifestations may arise, such as restriction of normal and color fields, etc., but if they are not suspected and sought for these symptoms pass unnoticed.

More serious results of chronic sinus infection are due to the entrance of the organisms into the gastrointestinal tract where they sometimes infect the appendix, and into the bronchi and lungs where they may give rise to bronchitis, pneumonia, and possibly tuberculosis.

A persistent unilateral nasal discharge is highly suggestive of a sinus infection provided the presence of a foreign body is eliminated.

In the author's experience the most useful methods in the examination are endo-rhinocopy and exploration of the sinuses with the suction syringe.

O. M. ROTT.

**Barnes, H. A.: The Combined Operative and Radium Treatment of Malignant Disease of the Nasal Accessory Sinuses.** *Laryngoscope*, 1920, xxx, 646.

All cases of malignant disease of the nasal accessory sinuses are operable as long as there are no metastases in the brain or neck. Before the operation is begun the nasopharynx is tightly packed with gauze. Up to this time the ether is given by the ordinary cone method, but afterward it is administered through a Rocci tube inserted through the mouth into the lower pharynx, where it is held in position by a strip of gauze packed lightly around it.

The Moure incision is made in the cheek and the front wall of the antrum removed, after which the main tumor mass is evulsed as rapidly as possible. In the ethmoid and sphenoid regions the mastoid curette is serviceable, and where space permits the small tonsil ring punch and the various angular cutting forceps ordinarily employed in sinus treatment are invaluable. When the alveolus and hard palate are involved the heavy rongeur forceps are necessary. Practically regardless of anatomical considerations, every particle of tumor tissue, all necrotic or soft bone, and, whenever possible, a small margin of healthy tissue should be removed. If the orbital tissues do not seem to be invaded the eye may be left. If there is any doubt as to involve-

ment of the orbit, however, an exenteration should be done. After all the tumor tissue has been removed the V-shaped flap is cut from the cheek and the cavity lightly packed with gauze surrounding a tube of radium emanations of appropriate strength.

The radium tube is left in place about two weeks, being re-inserted with each dressing during that period. As the tube loses one-sixth of its radiating strength every twenty-four hours, it is to all intents and purposes inert at the end of convalescence. The patient is then given three or four radium treatments at weekly intervals to forestall recurrences. In these radium treatments care must be taken to prevent any marked reaction in the tissues.

The author adds the reports of 8 cases. In this series there were 6 cases of carcinoma, 1 case of small round-cell sarcoma, and 1 of fibrosarcoma. With the exception of the case of fibrosarcoma, all were of the hopeless type, the condition being of long standing and involving both the ethmoid and the sphenoid. Three of the patients with carcinoma were operated upon for recurrences. In one case of sarcoma the eye had been enucleated a year previously, at which time further operative measures were abandoned because of the extent of the disease in the ethmoid region.

In the case of fibrosarcoma there is no evidence of recurrence fourteen months after the operation, while the cases of small round-cell sarcoma show no recurrence after twenty-six months after the operation. Three of the patients with carcinoma are dead; 1 is in the last stages of exhaustion with very extensive recurrence; and 2 are well with no evidence of recurrence or metastases twenty-five months and seventeen months respectively after operation. One patient with a carcinoma of over a year's standing which involved every sinus except the frontal sinus, died of septic meningitis following the operation. Of the eight patients, 4 (50 per cent) are without recurrence to date.

O. M. ROTT.

## THROAT

**Patton, W. T.: A Simplified Technique for Local Anæsthesia of the Tonsils—Intranasal Surgery without Packing.** *South. M. J.*, 1920, xiii, 750.

A medium-sized, fairly blunt, short pointed needle is inserted through the tonsil at its center outward and backward so that its point is placed as nearly as possible between the capsule and the superior constrictor at its exact center. It is forced through the tonsil tissue into the connective tissue between the capsule and aponeurosis where the nerve plexus runs, a point just beyond that at which slight resistance to its progress is offered by



the fibrous capsule. Twenty minims of the anæsthetic are sufficient. If the tonsil is large or long, two punctures, at the upper and lower pole, may be necessary.

The author mentions the Simpson splint only to condemn it. When intranasal packing is necessary he recommends strips of folded gauze  $\frac{1}{2}$  in. wide, lubricated with vaseline. Because of the discomfort and reaction after its use, however, packing is usually dispensed with, the raw surfaces being painted with compound tincture of benzoin and, in the submucous resection, the flaps being held together with a metal clamp. In the author's opinion, compound tincture of benzoin is as good a hæmostatic as the brain extracts and has the advantage that it glues the flaps together.

The advantages of the non-use of nasal packing are: (1) greater comfort; (2) less reaction in the tissues of the nose; and (3) usually less bleeding if the patient is put to bed at once and adrenalin spray and cold compresses are used. The disadvantages are: (1) hæmatoma, (2) the occurrence of later hæmorrhage necessitating packing. S. S. HOWE.

**Moore, I.: Angiomata of the Larynx.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Larynol., 236.

This paper is the result of a study of all the cases recorded in the literature (71 in number) with special reference to hæmorrhage and the treatment.

Angiomata may be classified as:

(1) Hæmangioma simplex or local telangiectasis; (2) hæmangioma cavernosum—the most common variety—which has a roughened surface and is frequently pedunculated; (3) hæmangioma diffusum or telangiectasis diffuse; (4) lymphangioma; and (5) mixed or atypical types such as angiomatous papillomata, angiomyxomata, and angiofibromata.

Among the 71 cases spontaneous epistaxis occurred in only 12, and varied from a small amount to profuse hæmorrhage and from a single bleeding to frequent repeated hæmorrhages.

Operative treatment was stated definitely to have been carried out in 39 cases. The tumor was removed by forceps in 19 cases, with the cold wire snare in 5, with the galvanocautery in 8, and by thyrofixure in

6. Suspension laryngoscopy and excision with the scissors was done in 1 case and radium was employed in another. Among these 39 cases considerable or severe hæmorrhage occurred in 25, and in 14 there was no hæmorrhage or only slight bleeding. In the 19 cases in which the tumor was removed with the forceps, severe bleeding occurred in 7, slight bleeding in 4, and none in 8. In the 5 cases in which it was removed with the cold snare, severe bleeding occurred in 2 cases, slight bleeding in 2, no bleeding in 1. In the 7 cases in which the galvanocautery snare was used, severe bleeding occurred in 3 cases, slight bleeding in 2, and no bleeding in 2. No hæmorrhage occurred in the 6 cases of thyrofixure or the single case treated with radium.

In the entire series of 71 case reports, there was no record of a death from spontaneous hæmorrhage. Induced hæmorrhage, however, was fatal in 3 cases, once following the removal of tissue for microscopic examination, once during tracheotomy due to incision into the growth, and in one other case the details of which are not given.

Among non-operative methods of treatment the use of sulphuric acid of phenol was successful in one case and the application of radium in another.

If the tumor is not causing any serious trouble it is best to leave it alone. Any nasal obstruction or lesion, however, must be corrected. Spontaneous hæmorrhage should be treated by the application of the galvanocautery to the bleeding point.

In endolaryngeal removal by the indirect method there is danger of hæmorrhage, laryngeal spasm, and the entrance of blood into the bronchi.

By the direct per-oral method the tumors may be removed by means of the laryngeal tube spatulæ, the suspension apparatus, or thyrofixure. The use of the laryngeal tube spatulæ by the direct method has the advantage over the indirect method in that the tube can be used as an intubation tube and suction may be effected through it.

The use of the suspension apparatus by the per-oral route is admirably adapted to the removal of angiomata of the larynx but should always be preceded by laryngotomy or tracheotomy.

Thyrofixure is the safest method. O. M. ROTT.



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# INTERNATIONAL ABSTRACT OF SURGERY

MARCH, 1921

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

Quain, E. P.: Abdominal Incisions. *Arch. Surg.*, 1920, i, 585.

The nerve and blood supply of the peritoneum are in close association with the transversalis fascia. The nerves to the abdominal wall are derived from the intercostal nerves, usually from the sixth to the twelfth. These nerves control the muscles and carry sensation from the skin and peritoneum. The nerves governing the rectus muscle enter it along its central line near the deep epigastric artery.

A vertical abdominal incision made away from the midline destroys the muscular support, inflicting an anatomical injury which cannot be remedied. These cut muscles retract, making closure difficult, and the usual catgut sutures will not prevent later separation of the tissues.

When drainage is left *in situ* for a few days a permanent defect in the wall with no tendency to re-approximation of muscle fibers remains. The nerve supply is destroyed by this lateral incision, and if two or more of the intercostal nerves are cut, the paralysis in the corresponding portion of the rectus becomes permanent. It is possible to incise the aponeurosis behind the rectus and preserve the visible nerve fibers running across the line of incision but this does not save the peritoneum as the nerve supply of the latter comes from the intercostal nerves at the costal margin. If this portion of the peritoneum is traumatized or infected, it cannot repair itself properly and adhesions result. The author's methods are as follows:

The median incision is the routine for most pelvic operations. The Pfannenstiel or transverse incision is sometimes preferred for operations on the round ligaments and when the abdomen is fat or short. If infection is known to be present in the pelvis, vaginal drainage is established prior to the operation.

In closing the incision special attention is given to the region of the Douglas fold to guard against the formation of a hernia. The anterior aponeuroses of the recti muscles are made to overlap  $\frac{1}{4}$  in. A

silkworm gut is then passed through this overlap, the ends being brought out through the skin well to the side of the incision and tied over a suitable button. The contiguous sides of the overlapping aponeuroses are well cleared of all intervening tissue to insure union.

The split-muscle incision placed somewhat below McBurney's point is used for operations on the appendix and lower ureter. The external oblique muscle is split far enough in both directions to permit easy retraction. Care is taken not to injure the nerve supply.

If pus is present, the opening between the external and internal oblique muscles is made as small as possible to prevent the spread of infection. The incision is enlarged internally by retracting or even severing the rectus muscle. Thus the right pelvis is reached if the oblique incision is low enough. When it is desired to enlarge the opening to the outer side a second transverse splitting of the deeper muscles is done after the external incision has been enlarged.

A straight transverse incision 2 in. above the umbilicus is made for operations on the biliary tract or stomach. This incision extends from near the linea alba to or beyond the linea semilunaris.

Closure is effected by a running plain catgut suture of the posterior aponeurosis and an interrupted, slightly overlapping chromic catgut suture of the anterior aponeurosis. The recti muscles usually come together when the external aponeurosis is sutured but catgut may be used in the muscle itself. The linea alba is overlapped and re-inforced by tying the silkworm gut over a button. Closure effected in this way in five hundred cases has convinced the author that it is associated with comparative freedom from pain in the wound, a good cosmetic result, and the absence of hernia. Spontaneous cure of one case of early postoperative bulging after a lapse of four months and 17 cases of postoperative hernia following longitudinal incisions away from the midline are reported.



In a review of 287 cases of abdominal operation in which the paramedial or the oblique incision enlarged contrary to the method described was used, a ventral hernia developed in 9 per cent of the former and 25 per cent of the latter.

If neither muscle nor nerve continuity is destroyed in the drainage of an abscess a resulting hernia can be repaired easily and adhesions are apt to be limited to the scar area. Sutures should not be used for partial closure of an infected wound.

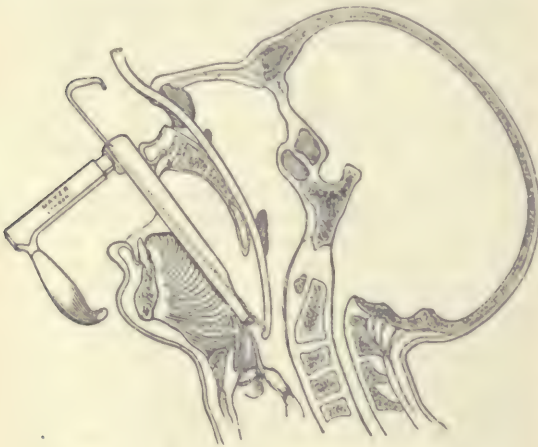
Draining of intra-abdominal infections should be done through a midline incision above the pubis or above one or both groins through separation of the lateral muscle fibers. When the drainage is placed near the flank, groin, or bladder, part of the drainage tract is made up of normal and permanent abdominal wall and the amount of adhesion is reduced by nearly one-half. Pushing the peritoneum away from the muscles with the drain reduces the intra-abdominal portion of the resulting adhesion to a minimum and decreases the resulting discomfort and disability.

MARCUS HOBART.

### ANÆSTHESIA

Rowbotham, S.: Intratracheal Anæsthesia by the Nasal Route for Operations on the Mouth and Lips. *Brit. M. J.*, 1920, ii, 590.

The author describes a method of inducing anæsthesia for use in plastic operations and operative procedures in the region of the mouth and lips. A catheter with a special eye is passed through the nose, nasopharynx, and oropharynx directly into



The passage of the catheter through the nose.

the trachea (See Fig.), being guided from the oropharynx directly between the cords into the trachea by a rod manipulated through a Hill's pattern laryngoscope. A second catheter may be used for a return nasal airway.

W. J. GREENFIELD.

McKesson, E. I.: Advances in Pure Nitrous Oxide-Oxygen Anæsthesia. *Am. J. Surg.*, 1920, xxxiv, Anæst. Supp., 98.

McKesson states that in the preliminary or induction stage of nitrous oxide-oxygen anæsthesia it is the usual practice to administer 100 per cent of nitrous oxide to produce unconsciousness as soon as possible by primary saturation of the blood with the anæsthetic gas. Very soon, however, a small amount of oxygen must be mixed with the nitrous oxide to prevent the jactitations and other manifestations of acute anoxæmia. If some fixed proportion of oxygen is decided upon it will be found too small for some patients and too great for others. This is well known to gas-oxygen users. Preliminary, or what may be called primary, saturation with nitrous oxide is about as far as many gas-oxygen anæsthesias are carried. If the operation requires deeper relaxation it is the practice of many anæsthetists to resort to ether, a mixed gas-oxygen-ether, or a sequence ether.

It is not necessary to use ether in order to relax an abdominal wall as this may be accomplished with gas-oxygen by secondary saturation. In primary saturation only the actively circulating blood is saturated before oxygen must be administered. There remain in the muscles and all other tissues considerable volumes of nitrogen and oxygen which in the early minutes of narcosis enter the blood stream and dilute the nitrous oxide, thus preventing a deeper anæsthesia. In order to displace more of the anæsthetic gases in the blood with nitrous oxide the technique of secondary saturation was devised.

Any general anæsthetic relaxes muscle, providing some coincident by-product or effect does not counteract this function. In nitrous-oxide anæsthesia there is sufficient anoxæmia to produce muscular spasm when muscular relaxation would have occurred if the anoxæmia had been prevented. By the usual technique, however, it has not been possible to prevent the anoxæmia and still have sufficient nitrous concentration. Resaturation or secondary saturation after the primary or induction saturation has been followed by oxygen eliminates the excess of non-anæsthetic gases and thus increases the amount of an anæsthetic gas and oxygen to the desired proportions to produce anæsthesia with relaxation of the muscles.

The principle of nitrous-oxide saturation is not radically different from that of ether or chloroform saturation. It requires, of course, a much higher concentration for a few moments than is necessary when the latter agents are used, and to secure this concentration the oxygen is temporarily cut off or markedly reduced below the proportion which will be administered after saturation.

In the past when anæsthesia was induced with gas-oxygen the patients were usually only partly saturated, and reflexes or rigidity of the muscles resulted just as under light anæsthesia induced with ether, chloroform, or any other general anæsthetic.

Because of the essential difference between the affinity of ether and chloroform for the tissues and



McKESSON'S N<sub>2</sub>O-O SIGN CHART

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	LIGHT ANÆSTHESIA Due to too much oxygen in the mixture.	NORMAL ANÆSTHESIA Due to a properly balanced mixture of N <sub>2</sub> O-O.	PROFOUND ANÆSTHESIA Due to too much N <sub>2</sub> O in the mixture or to partial obstruction of the respiratory passages.
RESPIRATION	(a) Superficial slow breathing, usually regular. (b) Prolonged inspiration. (c) Phonation due to reflexes or pain. (d) Holding breath, grunting.	(a) Full "machine-like" respirations. Regular and faster than normal. (b) Inspiration and expiration nearly equal. (c) No phonation. (d) Continuous uninterrupted respiration.	(a) Irregular rhythm (sobby), usually slower than normal. Spasmodic. (b) Prolonged expiration. (c) Phonation due to muscular spasm of the vocal cords. Often crowing. (d) Cessation of respiration from spasm of the muscles of exhalation.
MUSCULAR PHENOMENA	(a) Movements or rigidity of the muscles. (b) Facial expression of pain or consciousness. (c) Nausea, very rarely. (d) Reflex or voluntary resistance.	(a) Immobile and relaxed, but having normal muscular tonus. (b) Expression of normal sleep. (c) Quiet. (d) Quiet. Relaxed.	(a) Clonic movements, twitching or jerking in early minutes of induction, often starting in upper eyelids. (b) Expression wild looking. (c) Swallowing, retching, or vomiting common. (d) Tetanic, spasm, marked rigidity — opisthotonus in some cases.
EYE	(a) Pupils large, contract to light actively. (b) Conjunctiva sensitive. (c) Eyeballs roll. (d) Eyelids resist opening; wink when touched.	(a) Pupils small or medium, fixed. (b) Conjunctiva insensitive to the touch. (c) Eyeballs fixed or slowly roll. (d) Lids often slightly open, relaxed; no winking.	(a) Pupils fixed, enlarge progressively, and finally become irregular in shape. (b) Conjunctiva insensitive. (c) Eyeballs fixed in position or jerk. (d) Eyelids stiff; often wide open.
COLOR OF SKIN	(a) Pink or no change normally. (b) In anæmics, no color change. (c) In plethorics, slight cyanosis.	(a) Varies from pink to decided cyanotic tint. (b) In anæmics, no color change. (c) In plethorics, considerable cyanosis.	(a) Usually cyanotic. (b) In anæmics, slight flushing, rarely cyanosis. (c) In plethorics, almost black.
REMEDY	Decrease the percentage of oxygen in the mixture.		Increase the oxygen in the mixture or in (d) inflate the lungs with pure oxygen 1 to 3 times.

their very low affinity for nitrous oxide it has been difficult to maintain any certain degree of saturation without the use of very accurate administering appliances and a more accurate appreciation of the signs indicating changes in the depth of narcosis induced with nitrous oxide.

The fear of cyanosis on the part of the surgeon and anæsthetist has been one of the most powerful influences retarding progress in nitrous-oxide and oxygen anæsthesia. It is most natural to administer oxygen when the skin becomes dusky and by so doing to stop the further development of narcosis.

General ignorance concerning the significance of cyanosis itself and how much cyanosis from a certain cause will be tolerated for a definite period of time are subjects worthy of investigation.

Cyanosis as a sign indicating the depth of anæsthesia is not only absolutely valueless but misleading and dangerous because one patient may be cyanotic and still conscious or even fighting, while another may be pink, overdosed, and dying from the same mixture of nitrous oxide and oxygen.

Cyanosis may be classed as primary and secondary. It is primary when due to changes in the blood



itself, and secondary when due to local or external causes increasing the oxygen depletion of the blood. Cyanosis is due to the de-oxidation of oxyhæmoglobin to reduced hæmoglobin — a physiological process carried beyond the usual limits.

Blood normally leaves the lungs about 95 per cent saturated with oxygen. Therefore, only about 5 per cent is unsaturated. A greater portion of it will be unsaturated if aeration is interfered with by inspired mucus, blood, restriction of the airway, or a reduction in the supply of oxygen.

In old age, when metabolism is lower, less oxygen is consumed in the tissues and less cyanosis results from oxygen restriction. Old persons are usually ideal patients for gas-oxygen, being easily handled and rarely requiring secondary saturation to produce relaxation. The young adult on a similar oxygen percentage in the anæsthetic mixture usually shows a greater degree of oxygen unsaturation and more cyanosis.

The blood itself greatly influences cyanosis. The anæmic patient on a given mixture of nitrous oxide

and oxygen producing normal anæsthesia obtains sufficient oxygen to oxidize the small quantity of hæmoglobin he carries, while a full-blooded drayman on the same mixture would probably be cyanotic because the oxygen would be sufficient to oxidize only from 50 to 75 per cent of the hæmoglobin.

In well-marked anæmia when there is less than 50 per cent hæmoglobin cyanosis is rarely seen, and when the hæmoglobin is 30 per cent or less, cyanosis is rarely produced before death. It is therefore obvious that the fear of cyanosis is sometimes well founded and at other times unwarranted. In an operation one must be able to determine the cause of cyanosis if it occurs, and whether it is controllable or not before concluding that it is detrimental. A patient will tolerate very deep cyanosis for some minutes, a moderate amount for hours, and slight cyanosis for long periods of time if it is due merely to restriction of oxygen administered to the lungs for absorption.

The technique of primary and secondary saturation is given in detail.

ISABELLA C. HERB.

## SURGERY OF THE HEAD AND NECK

### HEAD

Chisholm, J. J., and Watkins, S. S.: Twelve Cases of Thrombosis of the Cavernous Sinus: From a Study of 50,000 Surgical Histories in the Johns Hopkins Hospital. *Arch. Surg.*, 1920, 1, 483.

Thrombosis of the cavernous sinus is a very rare condition. The authors found only 8 cases in 50,000 surgical histories covering the period from 1889 to 1919. The cavernous sinus is a paired sinus extending along the body of the sphenoid bone from the sphenoidal fissure to the apex of the petrous portion of the temporal bone. On cross section, it resembles the corpus cavernosum penis; hence its name. It is in relation to many important structures, including arteries, veins, and nerves. The areas from which infection may lead to thrombosis of the cavernous sinus include the ears and mastoid, the face, the orbit and eyelids, the nose and accessory nasal sinuses, the mouth and pharynx, including the teeth and tonsils, and the neck and scalp.

The three most frequent causes of thrombosis are marasmus, trauma, and infection, but the latter is by far the most common and nearly always secondary to a thrombophlebitis of afferent or efferent veins. In more than half the cases both cavernous sinuses are involved.

The symptoms fall into three groups: (1) those due to venous obstruction; (2) those due to involvement of neighboring nerves, and (3) those due to general sepsis. Evidence of venous obstruction includes exophthalmos, œdema of the retina, œdema of the eyelids and the bridge of the nose, dilatation and tortuosity of the retinal veins, clouding of the media, and opacity of the cornea. The cranial nerve

symptoms are ptosis, dilatation of the pupil, restriction of movements of the eyeball, and pain in the region supplied by the ophthalmic division of the fifth nerve. Pain in the eyeball and supra-orbital headache are frequent early symptoms. When only one eye is involved the condition must be differentiated from erysipelas, cellulitis of the orbit, tumors of the orbit, and arteriovenous fistula of the internal carotid artery.

In the treatment the focus of infection must be as thoroughly removed as possible. Operative treatment on the thrombosed sinus itself has not been successful.

The foci of infection in the reported cases were paranasal sinuses, 3 cases; alveolar infection, 3 cases; facial infection, 2 cases; pharynx (after tonsillectomy), 1 case; orbital abscess (injury), 1 case; not determined (probably paranasal sinuses), 2 cases. Only one of the patients recovered.

H. J. VANDEN BERG.

Neuhof, H.: The Treatment of Craniocerebral Wounds and Its Results. *Ann. Surg.*, 1920, lxxii, 556.

The greatest single element determining the seriousness of a head wound in the war was the condition of the dura as regards penetration. In other words, the decisive factor was whether or not the chief portal for the development of intracranial infection had been opened. The best classification of craniocerebral wounds is, therefore, one which is based on this fact. When such a classification is used, wounds of the head may be placed in various categories only at operation since their external appearance often gives little information as to the extent or situation of the deeper lesions.



The author classifies craniocerebral wounds as follows:

- A. Scalp wounds—dura intact:
  1. Simple fracture.
  2. Depressed fracture.
  3. Bursting fracture.
- B. Craniocerebral wounds—dura torn:
  1. Depressed fracture.
  2. Tangential:
    - a. Ventricle intact.
    - b. Ventricle penetrated by bone fragments.
  3. Penetrating (metal retained):
    - a. Ventricle intact.
    - b. Ventricle penetrated by missile.
  4. Perforating.

A careful local, general, and neurological examination should be made in every case of injury to the head. The reason for the local and general examination is evident. The neurological manifestation rarely decides the question of operative interference, but has a three-fold purpose: (1) to reveal the extent of the cerebral lesion, (2) to serve as a guide for the interpretation of postoperative complications or improvement, (3) for future reference in connection with functional results, late complications, and sequelæ.

Positive evidence of brain injury, such as paralysis or hemianopsia, may be evaluated, but negative evidence is worthless as regards the diagnosis, the prognosis, and the indications for treatment. Few or many symptoms and physical signs of cerebral injury may be present in cases of craniocerebral wounds.

Hæmorrhage from a wound of the head is rarely observed except on the battlefield. In the great majority of cases there was little or no oozing of blood by the time the patient arrived at the hospital.

Tangential injuries were common and caused serious lesions in the recent war. The wound is generally characteristic. The furrow or gutter cut through the soft parts varies in length and is generally wider in proportion to its length than in other types of wounds. A striking feature of tangential wounds is that if they involve the dura, brain substance almost invariably presents in, and extrudes from, the gap. Another equally characteristic feature observed at operation is that bone fragments, frequently of large size, are driven into the brain at right angles to the wound. Perforating (bipolar or through-and-through) wounds are the most frequently fatal of craniocerebral wounds because of the tremendous brain damage inflicted. They also form the group in which the least relief is given by operative measures.

X-ray examination is absolutely indispensable. Under usual circumstances an operation should never be undertaken without it. Exact localization of foreign bodies is not the only assistance X-ray examination gives, for it establishes also the presence of a depressed fracture.

The general symptom of wounds of the head is loss of consciousness. This is common whether the wound is slight or severe. Slowness of the pulse is

not always constant. A slow pulse is often associated with battle fatigue or inanition, and not infrequently a rapid pulse is associated with cerebral involvement. In fact, a greatly accelerated pulse is of grave significance; there was not a single recovery in the cases reviewed by the author in which the pulse rate on admission was 130 or more, whether operation was performed or not. Headache is the most common complaint of patients entering the hospital; regardless of the position of the wound, it is generally frontal and bears no relation to the gravity of the injury.

The time at which it is best to operate has been under discussion for some time. The purpose of the operation in cases of recent wounds is the elimination of the infective material. In the later stages the chief indication for surgical treatment is the control of infection.

Operation is contra-indicated in manifestly moribund cases. It is not indicated, or should consist, at most, in merely a local toilet of the wound in the great majority of perforating craniocerebral lesions.

An incision encircling the wound and all devitalized areas of the soft parts should be made to the bone.

In cases of depressed fracture a number of small perforations are made in the skull immediately beyond the bony lesion and then connected with linear cuts through the bone. After the perforations have been joined up, the section of bone is uptilted and the scalp and bone are removed in one piece.

If the dura is intact it is not opened. Adequate débridement of the dura consists in removing the torn edge for 1 or 2 mm.

The brain tract should be washed out with a catheter and hot salt solution to remove the cerebral debris, blood clots, bone fragments, and bits of cloth. Suction through the catheter should be instituted, and if the tract is large enough, digital exploration should be used. The foreign bodies should be removed with the finger catheter, or, if metal, by means of a magnet.

Hæmorrhage should be controlled in each step of the operation. Torn sinuses should be sutured.

The dura should be closed and, if impossible, fascia lata should be transplanted to close the defect.

The sutured scalp incision is drained in one or several places if the head wound was definitely infected. If a brain track is found to be purulent or to contain manifestly infected blood clot, drainage is indicated. Hæmorrhage should be a rare indication for drainage. In fact, drainage is seldom necessary after a properly conducted operation on a recent wound as it defeats the purpose of the operation.

H. A. MCKNIGHT.

**Bagley, C., Jr.: Gunshot Wounds of the Brain with Retained Missiles.** *Surg., Gynec. & Obst.*, 1920, xxxi, 449.

During the spring and summer of 1918, 175 cases of gunshot wounds of the skull and brain were studied at General Hospital No. 2, Baltimore, Md.



In 80 of these one or more operations were necessary. The total number of operations performed was 108. In this series there were 9 patients with metallic foreign bodies in the brain substance. Of this number 7 were operated on for the removal of the foreign bodies, 1 was discharged without an attempt at removal because of the small size of the missiles and their position in the brain, and 1, who had a metallic foreign body in the right cerebellar peduncle, died as the result of an abscess in the occipital lobe, no attempt having been made to remove the foreign body.

Removal of the foreign bodies was undertaken because of the presence or probability of infection. In 1 case in which a machine-gun bullet was lodged in the right cerebral hemisphere a small abscess developed which contained staphylococcal pus. In another, a large abscess containing staphylococcal pus was formed in the left temporal lobe. In 2 others the foreign bodies removed at operation gave positive staphylococcus cultures. The foreign bodies from the 3 remaining cases gave negative cultures.

The author is of the opinion that, because of the likelihood that metallic foreign bodies of average size will cause trouble even several months after the injury, they should be removed if the removal does not offer too great difficulties. He recognizes the fact, however, that metallic foreign-body substances may remain encapsulated in the brain without giving trouble, and cites as an illustration of this a case in which a large lead bullet remained in the left occipital lobe for ten years.

All of the patients of the series studied who were operated on had recovered or were convalescing at the time this article was written.

**Cardenal, S., and Castella, J.: Epilepsy of Traumatic Origin and Cerebral Hydatid Cyst Treated by Craniotomy, with Recovery** (*Epilepsia de origen traumático y quiste hidatídico cerebral; craniotomía; curación*). *Rev. españ. de med. y cirug.*, 1920, iii, 467.

In the case reported a fall was the cause of a contused wound in the superior posterior portion of the right parietal region and was followed by loss of consciousness for two hours. The first epileptic attacks occurred about a year after the patient's recovery from the immediate effect of the accident. In the clinical examination it was found that, though the traumatism was on the right side of the cranium, the paralytic or paresic phenomena, consisting of hemiparesis of the upper and lower right extremities and facial paralysis on the right side, indicated the presence of a lesion in the left half of the brain.

An extensive craniotomy on the left fissure of Rolando was therefore deemed necessary. In this operation hydatid cysts were discovered. The mother cyst occupied all the anterior third of the left hemisphere and was the size of a medium orange. Fearing the effects of the sudden decompression, the authors made a hasty débridement and closed the wound after inserting a gauze drain.

During the first twenty-four hours following the operation the patient had fourteen convulsive attacks which began in the right arm. In the intervals between these attacks there was complete muscular relaxation, coma, and involuntary micturition. This condition persisted for five days, during which time the convulsive attacks gradually diminished. By the twelfth day the temperature was normal and involuntary micturition had ceased but slight aphasia still persisted. The dimensions of the cranial cavity rapidly decreased. When the patient left the hospital he still showed facial paralysis and some motor disturbance in the right arm. A few months later he had one prolonged convulsive attack but from that time until the date of the article (eleven months after the operation) there had been no recurrence.

The authors believe that in cases of this type the indications for surgical intervention should be based not so much upon the external signs of localization as upon the cerebral focal symptoms, however slight the latter may be. A hydatid cyst should be considered the possible cause of an intracerebral process developing consecutively to a traumatism. A loose and perfectly aseptic tamponade is of great value in preventing the effects of negative intracranial pressure following operation. The vitality and defense of the encephalic tissues is extraordinary. The slow development of a cranial tumor no doubt makes it possible for the tissues to adapt themselves to the new conditions.

In the case reported the hydatid cyst did not communicate with the ventricles. Because of the patient's rapid recovery and his comparative freedom from epileptiform attacks for a long time, the authors have every hope for a permanent recovery.

W. A. BRENNAN.

**Lacouture, Charbonnel, and Lafargue: A Case of Hypophysectomy; Anatomical Research and the Present Status of Hypophyseal Surgery** (*A propos d'un cas d'hypophysectomie. Quelques recherches anatomiques et l'état actuel de la chirurgie de l'hypophyse*). *J. de chir.*, 1920, xvi, 491.

The operation of hypophysectomy was first done in France in 1909 by Lécène, and in that country has been performed only six times since then, including the operation reported in this article.

The authors have made anatomical studies regarding the forms of the sella turcica and its relation to the sphenoidal sinus on fifty cadavers but they are able to conclude only that there are extreme variations and that the anatomical findings are of little value to the surgeon. In pathologic cases, however, operation is usually simplified by distention of the sella.

Regarding the routes of approach the statement is made that the transfrontonasal route has been abandoned by its promoters. The simple endonasal route used by Kanavel and Hirsch is an æsthetic operation but requires a specialist as multiple complications may result from the ablation of the turbinates and the route does not give enough light. Of the



other routes employed the transmaxillo-ethmoidal-lateral undoubtedly gives plenty of room for the necessary manœuvres and is under the direct control of the eye whether half or all of the superior maxilla is resected. This has been verified by the authors a number of times on the cadaver. While it would appear that the use of this route would be mutilating, the results are as æsthetic as those obtained in operations performed by any other route and the turbinates are not sacrificed. The only loss is the posterosuperior part of the nasal septum which is of little importance. The procedure may be regarded only as a preliminary operation, however, and it cannot be denied that resection of the palatal vault and the alveolar border has its inconveniences. There is also some danger of meningeal infection.

In the authors' opinion the right lateral transsinuso-maxillary route is the most advantageous. The incision begins at the bottom of the right nostril and vertically sections the upper lip which is reflected by incising the gingival cul-de-sac. When the lip and nostril are turned back and the rasp has been used on the external surface of the maxilla the piriform orifice of the nasal fossæ is attacked at its lower part. The middle and inferior turbinates and the internal wall of the sphenoidal sinus are resected and raised in order to reach the floor of the sinus and nasal fossæ. The sinus floor is reached through the posterosuperior part of the septum. Although the middle and lower turbinates on one side are resected, this route appears to be the best. It affords plenty of light and room and there is little danger of infection.

The authors' case was that of a woman 40 years of age with a visual and glandular syndrome which led to a diagnosis of hypophyseal tumor. Operation was performed by the right lateral transsinuso-maxillary route as described. The sella was not much enlarged. The dura was incised and about 7 or 8 gm. of grayish-pink cerebroid tissue was removed by the curette. A mesh drain was placed through the right nares and the face then reconstructed. The operation was performed in May, 1919, and at the time this article was written the patient's general state continues excellent. The æsthetic result is remarkable. Histologically the tumor was an adenoma.

The authors review the mortality and results of hypophysectomy as shown in the literature. The results justify operation in cases of hypophyseal neoplasms as a growth of this kind, though it may develop slowly, is fatal if not removed. The diagnosis should be made early so that the tumor may not become too extensive. Surgical treatment should be supplemented by radiotherapy unless there is atrophy, and also with opotherapy.

W. A. BRENNAN.

**Blair, V. P.: The Treatment of Advanced Carcinomata of the Mouth.** *J. Missouri State M. Ass.*, 1920, xvii, 395.

Blair is of the opinion that the cause of poor end-results in cancer of the mouth is late or insufficient

operation. He claims that the inherent virulence of the disease is the dominant factor in only a few cases. If the condition is recognized early, the operative risk is nil and a cure is obtained in close to 100 per cent of the cases. Two factors are responsible for delay in treatment: (1) the interpretation of negative microscopic findings as positive evidence of the absence of cancer, and (2) the lack of appreciation on the part of the patient or the doctor of the importance of early exact diagnosis of apparently insignificant lesions of the mouth. Both radium and the X-ray are very helpful aids in the treatment and are used by the author with excision and cauterization.

Several illustrations are presented of operations for advanced cancer of the body of the tongue involving the floor of the mouth or the mandible. Blair states that infection extends below the clavicle in only 1 per cent of the fatal cases of cancer of the mouth. Early and thorough removal of all involved tissue is necessary. The method described in this article greatly increases the range of operability, and the postoperative functional results as regards speech are remarkably good.

M. A. BERNSTEIN.

**Davis, E. D. D.: Malignant Growths of the Upper Jaw and Antrum: A Survey of the Notes of Thirty-Nine Cases.** *Lancet*, 1920, cxcix, 1090.

The author has made a study of 39 cases of malignant growths of the upper jaw and antrum, 21 of which he has observed personally. Malignant growths of the nasopharynx, mouth, or palate involving the maxilla are not included. The cases are classified according to histology as squamous carcinoma, 19; round-cell sarcoma, 5; endothelioma or columnar carcinoma, 7; papillomatous growths, 3; chondrosarcoma, 2; spindle-cell sarcoma, 2; and melanotic sarcoma, 1.

The majority of squamous carcinomata begin in the ethmoid and spread along the orbital plate or roof of the antrum. A few, however, originate in the orbital plate itself. The growth is usually soft and friable and after filling the antrum takes the line of least resistance and breaks through the orbital plate. If the infra-orbital foramen is perforated, the growth may appear in the cheek as a puffy swelling below the eye. The alveolus and the palatal process are the last to be perforated. Recurrences are common following operations involving the cheek.

The round-cell sarcomata are clinically about the same as carcinomata. In all 4 cases examined the disease recurred after operation.

Endothelioma or columnar-cell carcinomata arise in the ethmoid, are considered a more favorable type for operation, and evidence less tendency to recur.

In each case of papilloma the growth appeared in the region of the inferior turbinate.

Chondrosarcoma is a rare type of malignant growth which is usually seen in children about 16 years of age. Protrusion of the eyes, expansion of the nose, and facial deformity usually result.



The spindle-cell sarcomata apparently began in the antro-nasal wall or palatal process in the 2 cases A recorded.

The growth in the 1 case of melanotic sarcoma observed originated in the vestibule of the nose.

Early diagnosis is difficult as the cancer does not produce symptoms until it is large enough to cause mechanical pressure. The most common symptom is pain in the cheek radiating to the frontal and temporal regions accompanied by a bloody discharge from the nose. As the pain is usually attributed to the teeth, they are extracted. Sometimes the growth can be seen on the lateral wall of the nose. The X-ray or transillumination shows a dark antrum. Sometimes a diagnosis can be made only by exploration. Late symptoms are proptosis, epiphora and expansion of the antral walls, and a puffy swelling of the cheek below the infra-orbital margin.

Five patients with inoperable conditions died within six months of the onset of symptoms. Six of 13 patients operated on had a recurrence within twelve months, 4 patients were not traced, and 3 were free from recurrence for one to two and one-half years.

The author exposes the growth thoroughly, determines its extent, and then excises it completely with a free margin of healthy tissue. Sometimes it is necessary to enucleate the eyeball if the orbit and ethmoids are involved. The usual Ferguson incision is made from the frontonasal suture down the side of the nose and through the upper lip. The cheek is then reflected upward and backward. The nasal bone, nasal process, and facial surface of the maxilla are removed to expose the growth, and, if the palate is not involved, the floor of the orbit with the growth is scooped out. Portions of the growth in the ethmoid may be removed with a punch forceps and spoon.

In view of the fact that the cervical glands may become involved secondarily, the advisability of a gland operation must be considered. The primary operation for removal of the growth is usually done as the first stage of this procedure, excision of the gland being performed as the second stage.

FRENCH K. HANSEL.

**Jamieson, J. K., and Dobson, J. F.: The Lymphatics of the Tongue, with Particular Reference to the Removal of Lymphatic Glands in Cancer of the Tongue. *Brit. J. Surg.*, 1920, viii 80.**

The lymphatic glands of the neck (Fig. 1) which receive direct vessels from the tongue are grouped as follows:

1. The submental glands. These are usually three or four in number and receive vessels from the tip and frenulum of the tongue.
2. The submaxillary glands. There are usually three submaxillary glands. They lie close to the submaxillary salivary gland.
3. The deep cervical glands. These glands lie in general association with the deep vessels of the neck. They may be subdivided into two groups:

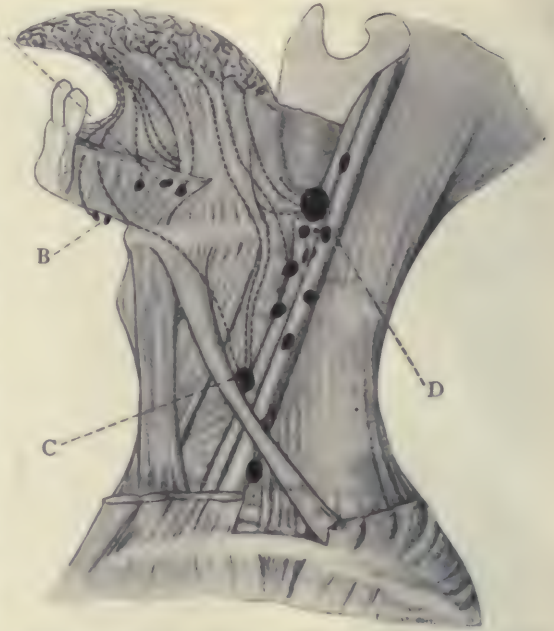


Fig. 1. Course of vessels from the tongue to the submental, submaxillary, and deep cervical glands. A, Submaxillary gland. B, Submental gland. C, Jugulo-omohyoid gland. D, Jugulodigastric gland.

a. The upper deep cervical glands. This group constitutes the glands lying above the tendon of the omohyoid muscle. The most important members of this group are the jugulodigastric glands which lie between the jugular vein and the posterior belly of the digastric.

b. The lower deep cervical glands. These glands lie below the tendon of the omohyoid. The most important gland of this group, the jugulo-omohyoid gland, lies near the tendon of the omohyoid.

The lymphatic plexus of the tongue is distributed over the whole surface of the mucous membrane and in the intramuscular spaces. Behind the circumvallate papillae the plexus is coarse and its vessels run toward the hyoid bone. In front of the papillae, the plexus drains into two sets of vessels, the marginal and the central (Fig. 2). The marginal vessels, which drain from the outer third of the upper surface and the under surface of the tongue, descend under the mucous membrane and terminate in the submental, submaxillary, jugulodigastric, upper deep cervical, or jugulo-omohyoid glands. The vessels from the frenulum or tip of the tongue may run to either side of the neck. The central vessels drain the remaining part of the upper surface of the tongue and the intramuscular plexus of the tongue, terminating in the submaxillary, jugulodigastric, upper deep cervical, and jugulo-omohyoid glands. The central vessels may terminate in either side of the neck. The vessels of the base of the



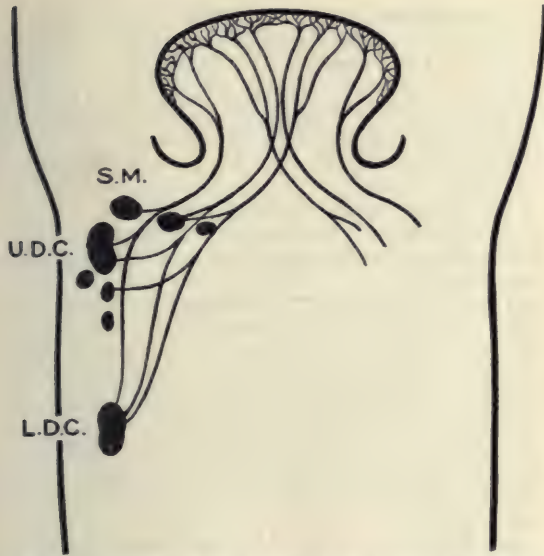


Fig. 2. Diagram of the course of the central lymphatic vessels of the tongue to the glands on both sides. S. M., Submaxillary glands. U. D. C., Upper deep cervical glands. L. D. C., Lower deep cervical glands.

tongue terminate in the upper deep cervical, jugulodigastric, and jugulo-omohyoid glands. The vessels near the midline of the tongue may run to either side of the neck.

The secondary vessels of the submental glands run to the submaxillary and jugulo-omohyoid glands. The submaxillary efferent vessels run to the jugulodigastric, jugulo-omohyoid, and intervening glands. The efferents of the jugulodigastric glands run to the deep cervicals below, and the efferents of the jugulo-omohyoid terminate in the supraclavicular glands (Fig. 1).

Since cancer of the tongue usually metastasizes very early, it is necessary to remove not only the primary growth, but also the lymphatic glands on one or both sides of the neck, depending on the location and extent of the growth. The glands which should be removed are those which receive lymphatics from the particular area on the tongue where the growth is situated.

The only adequate method of removing the glands is by block dissection of the neck. If the glands are not involved, a partial block dissection may be done, in which the submental, submaxillary, submaxillary salivary, and upper deep cervical glands, including the jugulo-omohyoid are removed with a portion of the sternomastoid muscle. When the glands are involved a complete block dissection in which all of the glands, including the sternomastoid muscle and the internal jugular vein from the clavicle upward are removed, is necessary. When a complete block dissection is done on both sides the internal jugular vein should be preserved on one side.

The bilateral operation is indicated if there are growths at the tip and frenulum, dorsal surface, base, and lateral border of the tongue which have spread toward the midline. The unilateral operation is indicated only when the growth is located on the lateral border of the tongue. The primary growth on the tongue should be excised widely on account of the possibility that cancer cells may have permeated into the lymphatics in the neighborhood of the growth. It is not necessary to remove all the lymphatic vessels intervening between the growth and the glands.

FRENCH K. HANSEL.

## NECK

**Boitel, W.:** Notes on the Etiology of Goiter (Notes sur l'étiologie du goitre). *Rev. méd. de la Suisse Rom.*, 1920, xl, 717.

From a study of goiter in the canton of Vaud, Switzerland, the author draws the following conclusions:

1. Goiter is very irregularly distributed in the canton of Vaud.
2. The distribution seems to coincide with the character of the physical geography. The minimum incidence is found in the Jura mountain chain and particularly on its eastern slope, while the maximum incidence is in the valleys of the Broye and the Mentue. The condition is more common also in the plain of the river Rhone than in the mountains of the vicinity.
3. Heredity was demonstrated in 47 per cent of the cases investigated.
4. It could not be determined whether the native population was attacked more or less frequently than new settlers.
5. Goiter has a distribution entirely different from that of typhoid fever.
6. Goiter seems to attack the rural populations more frequently than urban populations, but the difference is not very marked.
7. There is no proof that the primary cause of goiter is the lack of iodine.
8. The distribution of goiter in Switzerland does not correspond to the zone described by Hunziker on the basis of climate in regions between 600 and 1,000 degrees in altitude.
9. It is not possible to state definitely that there is a causal treatment of goiter.

W. A. BRENNAN.

**Clagett, A. N.:** The Treatment of Goiter with Radium. *Illinois M. J.*, 1920, xxxviii, 318.

In the author's opinion radium is beneficial only in Graves' disease and the malignant, parenchymatous, and toxic types of goiter. Regardless of the etiology of the condition, certain distinct changes take place in the thyroid gland, the blood, and some of the other organs. Many observers have noted a general increase in connective and lymphoid tissue, proliferation of glandular cells, and enlargement and multiplication of blood vessels. The colloid ma-



terial is scanty and lacks the usual bright stain. There is excessive iodine in the blood. Lymphocytosis and a decrease in the polymorphonuclear neutrophils are found.

On the basis of his own experience and 151 articles in the literature, Melchior states that enlargement of the thymus occurs in about 90 per cent of the cases of exophthalmic goiter. There is also enlargement of the spleen and the lymph glands.

If an operation is performed normal thyroid tissue is removed with the diseased portion of the gland. In the portion which is left certain of the diseased elements remain and often cause renewed proliferation. The thymus gland also remains. Radium possesses the ability to kill a diseased cell or a new growth cell in one-fifth the dosage necessary to kill a normal adult cell. When applied to a blood vessel it causes a swelling of the tunica intima followed by an obliterative endarteritis in the smaller vessels and a diminution of the caliber of those which are larger. Whether the toxic secretion is due to the additional blood supply or to the activity of the newly formed cells in the gland, or both, it will be affected by the radium. A further advantage of radium treatment is that, while its diffuse action over the entire gland will eliminate the toxic cells, the normal healthy tissue will not be affected if the dosage is estimated accurately.

The author reports 47 cases of exophthalmic goiter treated with radium. The ages of the patients varied from 16 to 74 years. Six of them had been operated upon before and had had recurrences, while 17 were considered poor operative risks. In 1 case out of 5 there has been no reduction of the goiter but in the others the circumference of the neck has decreased from  $\frac{3}{4}$  in. to  $3\frac{1}{4}$  in. The exophthalmos has been usually the last symptom to disappear. In 5 cases it has persisted. The pulse rate has been reduced from 20 to 50 beats, nervous symptoms and tremors have disappeared entirely, and the patients have gained in weight.

W. L. BROWN.

**Brenizer, A.: Goiter: Observations Drawn from 240 Operated and 82 Unoperated Cases.** *South. M. J.*, 1920, xiii, 815.

The author applies the term "goiter" to all enlargements of the thyroid gland.

To facilitate the diagnosis and treatment of goiter Brenizer outlines a classification of the pathological anatomy of the thyroid gland as follows:

A. Disturbances in development: (1) absence of the thyroid gland; (2) accessory thyroids.

B. Disturbances in metabolism: (1) atrophy following inflammation and the reduction of the blood supply by ligation of the vessels; (2) degeneration—parenchymatous, hyaline, amyloid, calcareous.

C. Disturbances in circulation: (1) local and general venous congestion leading to enlargement of the thyroid; (2) a marked development of either the arteries or the veins, a condition which may accompany any of the goiters and determine the nomenclature "vascular goiter."

D. Inflammations: (1) simple thyroiditis, not infrequently accompanying the various infectious diseases; (2) visible purulent infections, which are rare; (3) tubercles found in the thyroid in association with disseminated miliary tuberculosis; (4) gummata, which are found very seldom.

E. Regenerations: thyroid tissue is slow to regenerate.

F. Hypertrophic enlargements.

G. Tumors: (1) adenoma, the most common benign tumor of the thyroid gland; (2) malignant tumors.

The action of most of the other ductless glands—the pituitary, the parathyroids, the thymus, the adrenals, the pancreas, and the gonads—is associated with that of the thyroid. For example, in endemic cretinism not only the thyroid but also the hypophysis is usually degenerated strumously and in hypophyseal dystrophy a slight degree of thyroid insufficiency is not infrequently indicated by a myxedemoid puffiness of the face, especially in the later stages.

An important diagnostic test of exophthalmic goiter is the adrenalin test as carried out by Goetsch. It is a known fact that patients with exophthalmic goiter bear adrenalin poorly, and there are many symptoms of exophthalmic goiter which point to an increase of adrenalin in the blood.

The relationship between the thyroid gland and the sexual organs is shown by the swelling of the thyroid gland in the premenstrual period and by the false goiters of adolescence and pregnancy.

The author had under his care four cases of exophthalmic goiter in which an operation had been performed previously for large ovarian cysts, and two cases in which one operation had been performed previously for exophthalmic goiter and another operation was done subsequently for enormous cysts.

The presence of goiter is diagnosed by the following simple signs: (1) an enlargement over the front of the neck, more often asymmetrical than symmetrical and extremely variable in volume; (2) a normal and usually not adherent covering skin and considerable dilatation of the superficial veins; (3) a mass which is freely movable from side to side, but only slightly from above downward, and moves up and down with the trachea during deglutition; (4) respiratory troubles such as dyspnoea, hoarseness, and aphonia, due to interference with the trachea and the recurrent laryngeal nerve; (5) dysphagia from compression of the oesophagus; and (6) cyanosis from pressure on the veins.

The consistency of the mass varies with its anatomical structure. Unless it is malignant its surface is regularly smooth and its consistency soft and elastic. Cysts are fluctuating.

The author calls attention to the close analogy between the syndrome of Graves' disease and the effort syndrome. In France he was able to observe practically all transitions between a mild effort syndrome and well-marked cases of Graves' disease.



Operation is indicated in all outspoken cases of Graves' disease of at least one year's duration and in all milder cases after the failure of medical treatment.

For a successful outcome in cases of exophthalmic goiter it is essential that the patient be carefully prepared before operation by rest, the application of an ice-bag to the thyroid and heart, and cold baths. The time chosen for operation should be when the patient is in the best possible condition. It should be explained to her that the operation alone will not effect a cure, as following operation she must lead a simple life free from care and overwork.

G. W. HOCHREIN.

**Bram, I.: Diagnostic Methods in Exophthalmic Goiter, with Special Reference to Quinine.**  
*Med. Rec.*, 1920, xcvi, 887.

The symptoms of exophthalmic goiter and some of the diagnostic tests are discussed. Regarding the diagnostic tests, which are of importance in the borderline or "formes frustes" cases, the following conclusions are drawn:

1. The blood picture showing a leucopenia at the expense of the neutrophile polynuclear leucocytes and a relative increase in lymphocytes is of only relative value as it is similar to that in other thyroid affections.
2. The thyroid-extract test is to be condemned as by this means a latent case may be changed into a very active case.
3. The administration of digitalis is not reliable as it gives information regarding the heart rate only.
4. Complement-fixation tests are still in the experimental stage.
5. The hyperglycæmia test is supplementary to, or corroborative of, deductions already reached. The reaction can be demonstrated in diseases of other endocrine organs.
6. The basal metabolism test is a valuable aid to diagnosis, but because of intricate and costly apparatus and the special training necessary to interpret it, it is still unavailable for general use.
7. The injection of pituitary body extract is a fairly reliable means of confirming a diagnosis.
8. The Goetsch test or injection of epinephrin hypodermically is unreliable at the present time.

The author describes a test termed the "quinine test" which is both reliable and, because of its simplicity and harmlessness, practicable for the busy practitioner. This test is based on the fact that subjects of thyrotoxiæmia are exceptionally tolerant to quinine administered during the course of the disease and for a long time after the cessation of symptoms. The technique is as follows:

The patient is given a capsule containing 10 gr. of neutral hydrobromide of quinine four times a day with ample quantities of luke-warm water. Persons whose thyroid function is not excessive exhibit symptoms of cinchonism after they have taken between 30 and 50 gr.; susceptible persons or those having an idiosyncrasy will have symptoms

after the first or second capsule; while those who are tolerant may not complain until from 60 to 100 gr. have been given. In the presence of a hyperactive thyroid no symptoms develop even when the quinine is given over a period of weeks or months. In the cases of children smaller doses should be given.

I. W. BACH.

**Burrows, A., and Morison, J. M. W.: The Treatment of Exophthalmic Goiter by Radiations.**  
*Proc. Roy. Soc. Med.*, Lond., 1920, xii, Sect. Electro-Therap., 132.

For the purposes of this article, except for certain obvious factors, the effects of the roentgen rays and radium are regarded as identical. The technique employed with the former consisted of the use of rays which backed up a 6 to 7 in. alternative spark gap and were filtered through 1 to 3 mm. of aluminum and three layers of felt. The skin-anode distance was 10 in. The dose given to each side of the thyroid was 3 H units measured by Hampson's radiometer. With 3 ma. current the administration of this dose consumed about nine or ten minutes. Most of the cases received two treatments weekly for three or four weeks and then one treatment per week. Still later the intervals were lengthened to two, three, and four weeks, two months, three months, and finally six months. If relapses occurred, the intervals were shortened until satisfactory progress was obtained. Most of the cases were under observation for from two to five years even though all of the symptoms had disappeared.

The great majority of the radium applications were made by applying plates of radium or radium emanation to the skin over the enlarged gland. For general use, plates of a strength of 2.5 mg. of radium element or 2.5 millicuries of radium emanation to the square centimeter were found best. The size and number used varied with the severity of the case and the size of the thyroid gland. From 30 to 50 mg. were sufficient for a mild or ordinary case, but frequently this amount was increased to twice the amount, i. e., 100 mg. or mc. The plate was screened with 1.5 to 2 mm. of lead and the secondary radiation effectually kept from injuring the skin by twenty-four to thirty-six layers of black photographic paper. Twenty-four hour exposures were given every six weeks, the apparatus being fixed to the skin by adhesive strapping and bandage. Heavy treatments at long intervals (such as six weeks) were found better than smaller treatments given more frequently. A careful watch was kept of the condition of the skin. If it appeared at all red, treatment was postponed. After from six to twelve months of regular treatment the interval was lengthened if the progress of the case was satisfactory. After twelve months, even if the skin appeared normal, it was deemed advisable to omit a treatment once in a while.

As regards the results, it was found that radiation exerted an inhibitory effect on the hyperthyroidism which became more or less permanent after



prolonged treatment, probably because of a fibrotic process which replaced the glandular structures. The earliest sign of improvement was a general feeling of well-being. The pulse rate, after a quick drop followed by a slight rise, gradually became slower. The patient took on weight and the general symptoms gradually diminished. The exophthalmos was usually the last to disappear, at times persisting even in a virtually cured patient. When the thyroid enlargement was not of long standing it gradually grew smaller under treatment. In all cases in which there was a definite focus of infection, satisfactory progress was delayed until the focus was removed. Blood changes were not found to bear any definite relationship to the severity of the disease or the progress of the condition under treatment.

In a series of 100 consecutive cases treated with the roentgen ray, the results were "perfect," i. e., no signs or symptoms remained, in 27. In 49, "good functional" results were obtained, the patients being able to follow an ordinary, not too arduous life. In 20 cases the condition was "improved." Four patients gave up treatment and were not benefited.

In 100 consecutive cases treated with radium, "perfect" results were obtained in 20 and "good functional" results also in 20. In 40 cases the condition was improved. Twenty patients gave up treatment and were not benefited.

As regards ultimate results it appeared that mild cases responded best to ray treatment. The end-results in severe cases were less favorable. The most difficult to treat were those in which the exophthalmic type developed in a case of old simple goiter. Acute toxic cases were not found suitable for irradiation.

In conclusion, the authors state that irradiation of the thyroid gland is a safer method of treatment

and gives more uniform and promising results in cases of exophthalmic goiter than any other.

ADOLPH HARTUNG.

**Wilson, C. M., and Wilson, D.:** The Determination of the Basal Metabolic Rate and Its Value in Diseases of the Thyroid Gland. *Lancet*, 1920, cxcix, 1042.

According to the authors, the basal metabolic rate is "the total heat production per hour per square meter of body surface, with the subject at rest and in a postabsorptive condition." Estimation of the basal metabolic rate is of value in the diagnosis and treatment of both hyperthyroidism and hypothyroidism as it furnishes an exact index of the activity of the thyroid gland. The most suitable method of treatment in each case may be indicated, that is, whether it should be rest and drugs, X-ray, or surgery, and the results may be followed accurately by making frequent estimations of the basal metabolic rate.

The authors use the open-circuit type of apparatus similar to that of Boothby and Sandiford at the Mayo Clinic except that a gas bag is substituted for the gasometer. Analyses are made of the expired air which is collected during a known period of time and measured, and calculations are made to determine the amount of heat produced per hour per square meter of body surface. The standards of Gephart and Dubois are used to determine the area of body surface from the measurements of weight and height.

Three cases are cited to show the value of estimating the basal metabolic rate in diagnosing and in following the course of hyperthyroidism and myxœdema under different methods of treatment.

G. S. FOULDS.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Grabfield, G. P., and Squier, T. L.:** A Roentgenological Study of the Course of Post-Influenzal Pyopneumothorax. *Arch. Surg.*, 1920, i, 564.

During the last few months the authors have had the opportunity to study roentgenologically the course of 4 cases of post-influenzal pyopneumothorax. These were treated as conservatively as possible and in only 1 instance was recourse had to a radical surgical procedure. The roentgenograms, all of which were stereoscopic, were made with a hydrogen tube and a 33-in. target-plate distance. The patients were in the erect position and both exposures were made during one inspiration. Detailed histories of the cases are given, together with a description of the clinical course and the findings of the frequently repeated roentgen examinations.

These cases presented almost all the conceivable findings in such a process. The first two were of

interest because of the long duration of the empyema. Case 1 showed the strong tendency on the part of patients with this condition to recover spontaneously. The treatment consisted merely of rest in bed and a relatively few aspirations. Cases 2 and 3 also showed the tendency toward spontaneous recovery but the improvement became stationary under expectant treatment. Both of these patients rapidly recovered following a simple thoracotomy and tubular drainage. Case 5 showed the importance of position when a diagnosis of the presence of air and fluid is made by roentgen-ray examination and perhaps constitutes added evidence in support of the proposition that in this form of bronchopneumonia it is not necessary to consider the empyema until the acute process has subsided unless it becomes so massive as to cause mechanical difficulty.

In two cases (1 and 3) the condition of the chest at the present time is practically indistinguishable from that of the normal. It is not possible to state how much deformity will eventually remain in Case 2,



but judging from the other cases it is probable that a great deal of the pleural thickening will disappear. Unfortunately no recent roentgenogram of Case 4 was obtained. Clinically, however, the deformity is not great.

From these cases it seems evident that expectant treatment with aspiration is justified when indicated until improvement is no longer clinically demonstrable. The indication is then for the simplest surgical procedure which will supply adequate drainage.

The authors present the cases reviewed and their roentgenograms to demonstrate how completely the normal chest markings may be restored even after the presence of extensive adhesions, marked pleural thickening, and pulmonary deformity. In treating cases of this type it should be remembered that during the acute stage the effusion should not be removed unless there are definite indications. The procedures employed subsequently should be as conservative as possible and determined by the clinical course and frequent roentgen-ray examinations.

ADOLPH HARTUNG.

**Stewart, M. J., and Forsyth, J. A. C.: Massive Cholesterin Deposits in the Breast in Cases of Long-Standing Mastitis.** *Brit. J. Surg.*, 1920, viii, 59.

Attention is called in this article to the deposits of crystalline cholesterin formed in the tissues as the result of various pathologic processes. This usually occurs in tissue subject to local disintegration. In certain cases, as in the breast with duct obstruction, the retention of secretory products is an added factor. The crystals, usually tabular in type, may be acicular. Reference is made to the cases of two women aged 63 and 34. Both of these patients had an intermittent, bloody, purulent discharge from the nipple.

The causative factors of cholesterin deposits are the accumulation *in situ* of necrotic tissue, effused blood, glandular secretion, and inflammatory exudate. In the process of disintegration the more soluble constituents are absorbed, while the less soluble, such as cholesterin and the hæmatogenous pigments, remain in the tissues.

The histologic appearance of the cholesterin in paraffin sections is most striking and characteristic. An enormous number of clefts are found lying parallel to one another in large groups or arranged in pennant fashion. The crystals in these clefts have the optical and microchemical characteristics

of cholesterin. The intervening stroma contains foreign-body giant cells in large numbers and many foamy endothelial cells, especially around the periphery of the main deposits. J. A. BUCHANAN.

**Cheatle, G. L.: Cysts and Primary Cancer in Cysts of the Breast.** *Brit. J. Surg.*, 1920, viii, 149.

Whole sections of female breasts were used in the study undertaken by the author. Two types of cysts are described, one lined by epithelium which originated in the ducts, the other lined by epithelium which originated in the acini. Intracystic, simple, papillomatous growths are common in both and indicate that epithelial proliferation is an important factor in cyst formation.

Cysts situated at the periphery of the breast often become cancerous. In some cases epithelial proliferation may give the appearance of lacework within the cyst and in others the epithelium may be seen invading the fat and connective tissue. Cancer may be spread from cysts by coalescence of cancer-bearing cysts, by invasion of a simple cyst by a cancer-bearing cyst, or by invasion of a simple cyst by a cancer-bearing periduct lymphatic vessel.

Of the two types of simple cysts, cancer is more common in those lined by duct epithelium. The author does not claim that all cystic breasts will become malignant, but he shows by sections that cancer sometimes arises in cysts. For this reason the removal of all breasts which are clinically cystic is indicated.

MERLE R. HOON.

## HEART AND VASCULAR SYSTEM

**Renaux, L.: Plastic Reconstruction of the Popliteal Artery in a Case of Aneurism** (A reconstrução plastica da arteria poplitea num caso de aneurisma da mesma). *Brazil med.*, 1920, xxxiv, 509.

In a case of aneurism of the right popliteal artery the aneurismal sac was extirpated after ligature of the two extremities. This left a gap 17 cm. long so that approximation by suture was impossible. Accordingly, a portion of the internal saphenous vein about 18 cm. in length was resected and sutured to the ends of the artery. The points of suture were then covered with strips of the neighboring muscles. The operation consumed fifty minutes. The wound healed by first intention.

The clinical history left no doubt that the aneurism in this case was due to syphilis.

W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Warren, R.: Operative Treatment of Umbilical and Ventral Hernia.** *Lancet*, 1920, cxcix, 1048.

The author reports a series of 84 cases of ventral hernia in adults operated on in the past ten years.

Forty-nine of these were umbilical in type and 25 postoperative. Operation should be performed in the quiescent stage as surgery in the acute condition is attended by a very high mortality. The death rate following operation for strangulation or strangulation and gangrene is 25 and 33 per cent.



The author's operative technique is based on the method of Mayo, the principle of which is to suture the oblique and transverse abdominal muscles into the linea alba. A transverse elliptical incision is marked out and carried down to the rectus sheath and the aponeurosis of the external oblique. The skin and fat thus marked out are cleanly dissected off until the neck of the hernia is reached. A sufficient amount of aponeurosis is stripped bare of fat so that when the layers of the rectus sheath are overlapped transversely firm union may be obtained. The tissues forming the neck of the sac are divided carefully into the cavity of the sac all around, flush with the abdominal wall. If gangrene is present, the entire mass is removed *en bloc* and an anastomosis is made, preferably end-to-end. The finger is run around the margin of the aperture to free the adherent omentum and the bleeding points are ligated. The aperture of the linea alba is closed after the peritoneum is stripped, if possible, from the inner side of the aponeurosis for 2 or 3 in. around the opening. From two to four mattress sutures are introduced into the lower edge of the aperture and their free ends passed from behind forward through the upper border, 2 in. from its edge. When these are tied the upper edge overlaps the lower edge by 2 in. externally and is sutured to the aponeurosis on the outside. The skin is closed by a few interrupted sutures which pass deeply to obliterate the dead space.

Only 7 of the patients whose cases are reviewed were traced: 1 died six months after the operation (the cause uncertain); 3 were alive without recurrence two, three, and five years respectively after operation; 2 died of bronchitis five and seven years after operation, without recurrence; and 1 had a small bulge in the scar five years after operation.

Of the 35 cases of postoperative hernia, 13 followed appendectomies and 22 were sequelæ to median or paramedian laparotomies. In each group there was one herniotomy for strangulation. The average age of the patients was 35. There were no deaths in this series. The Mayo method was employed for the median or paramedian herniæ. In cases in which the hernia followed an appendectomy performed through a gridiron incision the various layers of the aponeurosis and muscles were exposed by a free dissection and the abdominal wall was reconstructed in its normal state, usually with some overlapping of the external oblique aponeurosis.

Seventeen cases were traced; 7 were cases in which the condition followed median or paramedian incisions. All these patients were in good condition. The only poor results were in cases in which the condition had followed the low right rectus incision for appendicitis. Of 7 cases in which the hernia followed the gridiron incision for appendicitis, 5 showed perfect results, and 2, a slight bulge five years after operation.

The relative merits of the gridiron and Battle incisions and the use of silver wire filigree are discussed. If the internal oblique and transversalis

muscles are split and not cut transversely there is little danger of a postoperative hernia. The use of silver filigree has given good results, but experience and wide dissection will reduce the number of cases requiring it.

MERLE R. HOON.

**The Biology of Peritonitis Due to Cholera** (La biologia della peritonite colerica). *Riforma med.*, 1920, xxxvi, 973.

This article refers to recent experimental studies of Sanarelli upon cholera. A culture of vibrios obtained in the province of Isonzo and grown in agar was injected into the peritoneal serosa and omentum of 8 guinea pigs and the animals were killed after varying periods.

Examination of the serosa and omentum of these inoculated animals revealed a marked difference between the anatomic-pathologic and bacteriological evolution of the local process and the normal course of the infection. It was noted that death from cholera occurred just as the peritoneal cavity had become free from the vibrios.

Following the injection the vibrios immediately appeared in the circulatory system; cultures on agar of blood taken five minutes later showed large numbers of vibrio colonies. This vibriœmia lasts only about one hour and then rapidly diminishes, to disappear entirely as the animal succumbs. With the vibriœmia there is a concomitant leucopenia, negative chemotaxis causing the leucocytes to accumulate in the different organs, especially the lungs. There phagolysis occurs with the formation of a complement which produces granular transformation of the vibrios. It follows, accordingly, that the combination of omental leucocytosis and peritoneal leucopenia prevents the polynuclear diapedesis on which the histologic defense of the organism against the vibrios depends.

## GASTRO-INTESTINAL TRACT

**Holcomb, O. W.: Acute Dilatation of the Stomach.** *Minnesota Med.*, 1920, iii, 486.

By "acute dilatation" of the stomach is meant a distinct entity of uncertain etiology characterized clinically by sudden onset, rapid distention of the abdomen, the vomiting of large quantities of dark watery fluid, and symptoms of collapse. Brinton (1858) and Rokitsky (1883) were the first to call attention to this condition. In 1883 Fagge described the disease more accurately. Because of our limited knowledge regarding the pathogenesis of acute dilatation many theories have been advanced as to its probable course, but for purposes of discussion these may be divided into:

### 1. Functional causes:

a, Paralysis of the stomach, first suggested by Brinton and later supported by Steida, von Herb, Braun and Seidel. Braun and Seidel conclude that this condition is due to alterations in the gastric innervation, central, peripheral, or reflex.



b, Anæsthesia during the course of an operation.

2. Organic or mechanical causes:

a, Compression of the horizontal portion of the duodenum by the root of the mesentery and mesenteric vessels.

b, Torsion or volvulus of the stomach.

In the main it may be said that there are two groups of cases — postoperative cases and those not due to operation. In 1918 Coolin of Dublin collected 188 cases, of which number 69 per cent occurred after operation, while 31 per cent were due to non-operative conditions such as over-eating, injury to the abdominal wall, acute or chronic disease, and in rare instances child-birth.

The disease occurs at all ages but especially between the twentieth and fortieth years. It is more frequent in the female sex. In approximately 75 per cent of the cases it follows operation. The onset may occur on the operating table or while the patient is still under the anæsthetic, but in the majority of cases there is a lapse of from one to several days before the symptoms set in. The first signs to attract attention are the vomiting of green or dark brown fluid and abdominal distention. Later, symptoms of respiratory and circulatory distress are noted, the temperature drops, cyanosis or lividity appears, the tongue becomes dry and beefy, there is unquenchable thirst, and the urine is scanty, at times even being entirely suppressed.

Postmortem examination reveals an enormously dilated stomach which occupies the greater portion of the peritoneal cavity. The gastric walls are thinned and show numerous hæmorrhages and erosions.

Recovery depends upon the recognition and treatment of the case. The best treatment consists of the prompt use of the stomach tube. All food and water by mouth should be stopped and proctoclysis with rectal feeding instituted. When proctoclysis is without benefit, hypodermoclysis should be resorted to. Lavage with lukewarm water may be repeated every two or three hours or as soon as the patient shows symptoms of distress due to the distention. The other important factor in the treatment is the prone position first described by Schnitzler. The patient is turned with the abdomen down and a pillow or two is placed under the hips for support. Of 26 patients thus treated, 22 recovered. Drugs are of little value in this complication.

The conclusions drawn are as follows:

1. Acute dilatation of the stomach, while not common, is by no means rare.

2. Although the symptoms are much alike in all cases, the pathogenesis varies.

3. Acute dilatation of the stomach must be differentiated from volvulus of the stomach.

4. The condition is often mistaken for shock, ileus, obstruction, etc.

5. Mild cases may be followed by spontaneous recovery. In most instances, however, the condition proves fatal if untreated.

6. Early and repeated gastric lavage will save life in the majority of cases.

7. The posture treatment may be of great value.

8. Surgery is not indicated unless there are definite signs of obstruction. LOUIS HANDELMAN.

**Carman, R. D.: The Roentgen Diagnosis and Localization of Peptic Ulcer.** *California State J. M.*, 1920, xviii, 378.

The medical and surgical treatment of peptic ulcer has long been a subject of controversy; the method of treatment depends on proper diagnosis. The surgeon has the advantage in that he can see, feel, and demonstrate the presence of ulcer before he decides on the method of operation. Few medical men can be certain of the condition unless the ulcer can be demonstrated by the roentgen ray. Treating ulcers diagnosed on clinical findings and treating those diagnosed on roentgen findings are different matters. Although the roentgen ray is not infallible and may not distinguish simple ulcers from malignant ulcers, it can point to the fact that a lesion is present and frequently hastens the diagnosis.

The general opinion that duodenal ulcer has a more definite syndrome than gastric ulcer may be due to the fact that it is about four times as common as gastric ulcer. Moreover, many patients may have learned the ulcer symptoms from former examinations and, thus influenced, may recite a history typical of ulcer.

The localization of peptic ulcer has an importance apart from its bearing on diagnostic accuracy. In 245 cases of gastric ulcer diagnosed by the roentgen ray and operatively confirmed during 1918 and 1919, 33 (14.47 per cent) were found to be carcinomatous. Twelve (8.6 per cent) of these were not recognized as malignant before operation. Only 6 primary malignancies were found in 4,500 operations on the duodenum. Since diagnosis is the basis of treatment, the ability to distinguish gastric ulcer from duodenal ulcer in the diagnosis should be of invaluable assistance to the physician from the standpoint of prognosis.

Three thousand, eight hundred and ninety of 23,598 patients examined at the Mayo Clinic from July 1, 1918, to January 1, 1919, complained of gastric symptoms sufficient to warrant roentgenological study. Operation was done in 343 of 528 cases diagnosed as cases of peptic ulcer and the diagnosis was confirmed in 337 (98.21 per cent). Four hundred and seventeen of these were diagnosed as cases of duodenal ulcer by the roentgen ray and 111 as cases of gastric ulcer, a ratio of 4 to 1. Two hundred and fifty-five of the 417 cases diagnosed as cases of ulcer were operated on; in 246 (96.47 per cent) the diagnosis was confirmed. Operations were performed in 88 of the 111 cases diagnosed as cases of gastric ulcer; in 84 (95.45 per cent) the diagnosis was confirmed. The discrepancy between the percentages of confirmed peptic ulcer (98.21 per cent) and the confirmation of duodenal ulcer (96.47 per cent) and gastric ulcer (95.45 per cent) independent-



ly is due to an incorrect diagnosis in 2 cases of gastric ulcer and 5 cases of duodenal ulcer.

There were 21 cases in which a definite pathologic condition was shown but accurate localization was impossible. The final diagnosis in the 18 cases brought to operation was: gastric ulcer, 4; duodenal ulcer, 3; gastric and duodenal ulcer, 1; cancer of the stomach, 8; cholelithiasis with marked adhesions, 1; and a lump of questionable nature in the pyloric muscle, 1.

Sixty-seven cases were diagnosed as "indeterminate," a term signifying that from a roentgen-ray standpoint it was impossible to express either a negative or a positive opinion. Twelve of these were operated on, the findings being as follows: duodenal ulcer, 5; gastric ulcer, 1; cholecystitis, 2; cholecystitis with stones, 1; cancer of the stomach, 1; lesion at the ring, 1; and nodule in the liver, 1.

Exploration of the stomach and duodenum was done during operation for various abdominal conditions in 351 of 3,105 cases diagnosed "negative stomach and duodenum." The diagnosis was confirmed by the surgeon in 336 cases (95.76 per cent).

Deformity of the luminal contour, either organic or spasmodic, is the principal roentgenological sign of disease of the digestive tract. It reveals not only the lesion, but also its location, size, and often its character.

Four types of gastric ulcer may be distinguished at operation: (1) small mucous erosions and minute, slit-like ulcers; (2) penetrating ulcers with relatively deep craters; (3) perforated ulcers, with or without the production of accessory pockets; and (4) carcinomatous ulcers.

The roentgen-ray signs of gastric ulcer may be divided into three groups:

1. Direct signs (pathognomonic): *a*, the niche; *b*, the accessory pocket.

2. Indirect signs (diagnostic): *a*, organic hour-glass stomach; *b*, spastic manifestations (1) spasmodic hour-glass stomach, (2) gastrospasm.

3. Corroborative signs (not diagnostic): *a*, retention from the six-hour meal; *b*, gastric hypotonus; and *c*, alterations of peristalsis.

The niche is a bud-like projection from the barium-filled stomach and is an index either of a penetrating or a perforated ulcer. The accessory pocket is a pouch-like excavation ranging in diameter from 1 to 5 cm. Both niche and pocket are obviously signs of advanced ulcer.

Organic hour-glass stomach is an occasional sequence of penetrating or perforated gastric ulcer. Roentgenologically it can be distinguished from the spastic type of hour-glass stomach. It is persistent at all examinations, constant in situation, and remains unaltered after the patient has been given an antispasmodic to physiological effect.

There are two types of spasmodic hour-glass stomach, the intrinsic and the extrinsic. For the differentiation of intrinsic and extrinsic spastic

deformity tincture of belladonna is prescribed. Belladonna or atropin will not differentiate spasmodic and organic forms of hour-glass stomach, but will differentiate intrinsic and extrinsic spasm.

A distinct residue in the stomach from the six-hour meal is seen in 55 per cent of the cases of gastric ulcer. Practically 90 per cent of all gastric ulcers occur in the vertical portion of the stomach above the incisura angularis. The retentions which they produce have been assigned respectively to pylorospasm excited by the ulcer, impairment of peristalsis, and hypotonus.

Gastric hypotonus, shown by sagging and expansion of the lower gastric pole, is a frequent accompaniment of ulcer. Hypotonus alone possesses little significance, but if it does not accord with the habitus of the patient, the possibility of an ulcer should be considered.

The variations of peristalsis met with in gastric ulcer include weak peristalsis, hyperperistalsis, absence of peristalsis from the ulcer-bearing area, and anti-peristalsis. None of these is peculiar to ulcer, but all of them are more or less suggestive of a gastric lesion.

Differentiation of ulcer and cancer is rarely difficult roentgenologically. Usually ulcers project from the gastric contour, while in carcinoma the growth with its resultant irregularity extends into the gastric lumen. In borderline cases, in which carcinoma cells are found in the ulcer, differentiation may be impossible.

An ulcer crater with a base of extreme size should suggest malignancy. When a niche 3 cm. or more in diameter is noted there are apt to be microscopic signs of carcinoma.

Fully 95 per cent of duodenal ulcers are found in the first 4 or 5 cm. of the duodenum, usually on the anterior wall. Judd is impressed with their frequent multiplicity.

The roentgenological indications of duodenal ulcer may be classified as follows:

1. Direct signs: *a*, deformity of the duodenal bulb, *b*, duodenal diverticulum.

2. Indirect signs (diagnostic): *a*, gastric hyperperistalsis, *b*, gastric retention from the six-hour meal (the combination of hyperperistalsis with gastric retention and a normal gastric outline is diagnostic of duodenal ulcer with obstruction).

Deformity of the duodenal contour stands first among the roentgenological signs of diagnostic value. The deformities more or less characteristic of duodenal ulcer may be due to: (1) general distortion, (2) a niche, (3) an incisura, (4) a diminutive bulb, (5) an accessory pocket, or (6) a diverticulum. All these deformities are typical and pathognomonic of ulcer.

Hyperperistalsis consists of three or more waves running along the stomach on both curvatures. The phenomenon of hyperperistalsis is not limited to duodenal ulcer as it may accompany disease of the gall-bladder or appendix or be seen under normal conditions in the hypertonic stomach.



**Farr, C. E.: Perforating Gastric and Duodenal Ulcer.** *Ann. Surg.*, 1920, lxxii, 591.

Of the acute abdominal crises, perforation of a gastric or duodenal ulcer ranks first in its suddenness of onset, violence, and gravity. Contrary to statistics, a large majority of the author's cases of acute perforation have been gastric rather than duodenal. The duration of symptoms was within twenty-four hours. The peritonitis was localized to the site of perforation in all except 2 fatal cases. For the uncomplicated cases no toilet of the peritoneum was carried out and no drainage was used. Closure was easily effected in all except 2 cases. Infolding mattress sutures of fine catgut in two layers widely placed were used exclusively. Posterior gastro-enterostomy was done but once.

Recovery was remarkably smooth and uncomplicated except in the 2 fatal cases. Of the 21 cases, 2 came to gastro-enterostomy for pyloric stenosis, and in 1, suturing of a perforation had been done in another clinic.

The diagnosis of acute perforation of the stomach or duodenum is remarkably easy except in complicated cases. On the other hand, acute perforation of the gall-bladder due to gangrene, acute pancreatitis, and occasionally a high-lying perforated appendix will give symptoms suggestive of stomach perforation. In none of the author's cases, however, was there any such agonizing pain or board-like rigidity in the first few hours. After twenty-four hours, of course, the symptoms are masked by the spreading peritonitis. Shock never appeared to be present in the author's cases and vomiting was not frequent.

Occasionally a perforation may become quickly adherent and closed. The great majority, however, go on to spreading peritonitis and death if not closed surgically.

The treatment of acute perforations is obvious and easily carried out. A simple high laparotomy and suture of the opening can be done in a very few minutes. The argument for gastro-enterostomy is that it tends to aid in healing the ulcer and obviates a later operation for stenosis. It is a well-known fact, however, that by far the greater number of perforating ulcers tend to heal promptly after closure and that re-perforation, hæmorrhage, and stenosis are exceptional sequelæ. Moreover, the end-results of gastro-enterostomy even in the best clinics are not 100 per cent good and it must be borne in mind that the majority of the cases of acute perforation are operated upon by surgeons of much less ability and experience.

In the author's 24 cases of acute perforation recovery resulted in 21. R. R. MUSTELL.

**Lewisohn, R.: Persistence of Pyloric and Duodenal Ulcers Following Simple Suture of an Acute Perforation.** *Ann. Surg.*, 1920, lxxii, 595.

The idea is prevalent that acute perforation of an ulcer of the stomach or duodenum after simple suture will result in the spontaneous disappearance

of the ulcer. For this reason many surgeons claim that simple closure of the perforation to prevent leakage of gastro intestinal contents is all that is necessary. Gastro-enterostomy they consider an unnecessary and rather dangerous procedure in these cases. Following simple suture, however, the author has noted that the ulcer symptoms are apt to persist. Of 7 patients he re-examined following operation 6 had been treated by gastro-enterostomy and 1 by simple suture. The patient treated by simple suture was the only one who still complained of pain and fullness in the epigastrium and occasional vomiting. The others are entirely well. In the case of simple suture the X-ray showed considerable residue in the stomach after six hours.

The main points against gastro-enterostomy are the danger of spreading infection and the time consumed by the operation. In answer to these objections Lewisohn states that if the perforation has occurred into the free peritoneal cavity the whole cavity is infected already, while if the perforation is walled off and the peritonitis is localized, the rest of the cavity can be safely protected by packing. Moreover, a gastro-enterostomy may be performed so rapidly that the end-results are not changed. When great haste is necessary a Murphy button may be used. A great advantage of an immediate gastro-enterostomy, especially if it is combined with exclusion of the pylorus, is that the after-treatment (feeding) is simplified. Gastro-enterostomy will also safeguard drainage in spite of the formation of adhesions. Its chief advantage, however, is its curative effect on the ulcer. Simple suture leaves the ulcer-bearing areas exposed to traumatism. R. R. MUSTELL.

**Eusterman, G. B.: A Clinical Study of 83 Gastrojejunal Ulcers.** *Minnesota Med.*, 1920, iii, 517.

In Group 1 are 47 cases which followed gastro-enterostomy performed in the Mayo Clinic chiefly for duodenal ulcer, and in Group 2, 36 cases in which the primary operation was done elsewhere. The various reasons or causes for disappointment or failure after gastro-enterostomy are enumerated.

Gastrojejunal ulcer, a formidable complication, was the condition for which a secondary operation was performed in 47 of 3,700 cases treated by gastro-enterostomy in the Mayo Clinic (1.3 per cent).

The ratio of males to females was 7 to 1, which is two and one-half times greater than the sex ratio in primary ulcer.

The cause of gastrojejunal ulcers is largely technical error or mechanical defect in the operation itself. In one-third of all the cases it was highly probable that the causative factor was retained unabsorbable suture material.

In 87 per cent of the cases of regular and irregular types of ulcer the symptoms resemble those of benign ulcer. The remainder are included under the intestinal and complication types.

Eighty-eight per cent of the patients, including those who obtained incomplete or no relief, had a



recurrence of symptoms within one year after the original operation.

Late painful recurrence is frequently due to a gastrojejunal ulcer. Other possibilities to be ruled out are reactivation of the original partially healed ulcer, new ulcer, and malignant degeneration in a gastric ulcer.

Clinical features of diagnostic importance are: (1) gross gastric retention, (2) a small movable mass in the region of the umbilicus, (3) postoperative pain assuming a lower level, (4) gastrocolic fistula, (5) gross or occult bleeding with associated anæmia in the absence of pre-operative hæmorrhage, and (6) a progressive course and lack of satisfactory response to medical treatment.

Exact pre-operative localization of the ulcerative process is possible only through the cooperation of the roentgenologist. The roentgenological examination furnished reliable direct or contributory evidence in 65 per cent of the cases.

Careful operative technique combined with immediate and continued postoperative medical management should greatly reduce the incidence of the lesion. Under any circumstances medical participation in addition to the removal of foci of infection insures satisfactory surgical end-results.

**Pauchet, V., and Delore, M.: Cancer of the Stomach** (Cancer de l'estomac). *Presse méd.*, Par., 1920, lxxxii, 793.

Cancer of the stomach constitutes half of the cancers of the digestive tract and one-third of the cancers of the entire body. Three-fourths of the cancers of the stomach are engrafted on old ulcers. The greater number of cases of ulcer are not recognized, being diagnosed as cases of dyspepsia.

Attention is called to three essential points in the diagnosis:

1. Gastric distress of long standing or associated with pain which returns at fixed intervals is suggestive of malignancy. This is especially true if there are periods of freedom from symptoms which give the impression that the condition has been cured.

2. Chemical examination of the gastric contents is necessary and should be followed by an X-ray examination of the stomach.

3. It is almost impossible to distinguish the recent and medically curable ulcer from the chronic incurable ulcer.

All patients with chronic ulcers should be operated on and all those over 40 years of age who have gastric ulcer should be subjected to operation without delay. If cancer is present, gastrectomy, gastro-enterostomy, or jejunostomy is indicated. Jejunostomy prolongs life for from two to eight weeks and is applicable only as a temporary measure.

Gastrectomy is the only operation offering a possibility of cure. If the surgeon operates on only movable and slightly adherent tumors, a statistical operative cure in 95 per cent of the cases is obtained. If the tumors are attached, the operative mortality is 25 to 30 per cent. Before any operation, general

abdominal exploration is necessary to exclude metastasis.

The following program for anæsthesia should be followed:

1. Local anæsthesia of the abdominal wall induced with novocaine 1:200. This is sufficient for gastro-enterostomy, but not for gastrectomy.

2. Parietal anæsthesia combined with the injection of the posterior splanchnics.

3. Spinal anæsthesia.

Postoperative hæmorrhage should be treated by washing the stomach with salt solution. If it continues the stomach should be lavaged with a 1:4,000 solution of silver nitrate, but none of the solution should be left in the stomach. Other complications are vicious circle, separation of the wound, bronchopulmonary infection, infection of the wound, parotitis, and acidosis.

J. A. BUCHANAN.

**Cividali, A.: A Contribution to the Diagnosis of Gastrocolic Fistula** (Contributo alla diagnosi delle fistole gastro-coliche). *Policlin.*, Roma, 1920, xxvii, sez. chir., 301.

The principal symptoms of gastrocolic fistula are frequent diarrhoea and fæcal vomiting without symptoms of incarceration. Less important symptoms are rapid emaciation sudden cessation of daily vomiting followed by the onset of diarrhoea, a fæcal odor to the vomitus and eructations, the possibility of inflating the stomach through the rectum, the vomiting of substances introduced by enema, and the presence of hydrochloric acid and pepsin in the fæces.

The author discusses also the X-ray findings. Gastrocolic fistulæ of non-neoplastic origin may be cured by operation.

W. A. BRENNAN.

**Métraux, A.: The End-Results of Simple Posterior Gastro-Enterostomy in Cases of Gastric and Duodenal Ulcer** (Les résultats éloignés de la gastro-entérostomie postérieure simple dans les ulcères de l'estomac et du duodénum). *Rev. méd. de la Suisse Rom.*, 1920, xl, 569.

The author has made an analytical study of 210 cases of gastric and duodenal ulcer treated by simple posterior gastro-enterostomy in the Roux clinic in Lausanne. These included: ulcer of the pylorus, 64 cases; ulcer of the lesser curvature, 67 cases; ulcer of the anterior wall of the stomach, 14 cases; ulcer of the posterior wall of the stomach, 13 cases; ulcer of the greater curvature, 4 cases; ulcer of the duodenum, 27 cases; multiple ulcers, 12 cases; and occult ulcers, 9 cases. There were 69 cases of complicated ulcers, viz., callous ulcer, 31 cases; infiltrating ulcer, 19 cases; ulcerous tumors, 11 cases; and perforated ulcers, 8 cases.

Operation was followed by recovery in 189 cases (90 per cent) and a fair result in 14 cases (6.6 per cent). Seven patients died, a mortality of 3.3 per cent. One death was due to recurrence, one to what appeared to be cancerous degeneration, and one to uræmia.



In the cases of pyloric ulcer recovery resulted in 90 per cent, while in those of ulcer of the lesser curvature the recoveries varied from 71.4 to 89.7 per cent according to the situation of the lesion. In the cases of ulcer of the anterior wall of the stomach a recovery resulted in 92.8 per cent, while in ulcer of the posterior wall a recovery was obtained in 92.3 per cent.

Recovery resulted also in 100 per cent of the cases of ulcer of the greater curvature, in 96.5 per cent of the cases of duodenal ulcer, and in from 50 to 88.8 per cent of cases of ulcers in other locations.

The time since the operation varies from eight months to twenty-one years. The patients considered cured are those who for several months or years have been able to do their full work and to eat any kind of food without experiencing symptoms which could be referred to the trouble for which the operation was performed.

The results in this series, the author believes, demonstrate well the excellence of gastro-enterostomy and its superiority to all other operations for ulcer. Even if annular resection gave equally good results (which is not the case), the simplicity of gastro-enterostomy would make it preferable.

The author discusses in detail the objections which have been made to gastro-enterostomy. It has been stated that this operation is efficacious only in cases of marked pyloric stenosis. To this Métraux replies that the X-ray examination of 112 cases showed that the new opening and the pylorus functioned simultaneously and normally in 95 cases.

Another criticism is that when the spasm or pyloric obstruction has disappeared the food tends to resume its natural course. This, the author states, is not true as in the great majority of the cases reported the anastomosis functioned with the pylorus even after fifteen years.

The objection that gastro-enterostomy permits regurgitation has been rendered invalid since the adoption of the von Hacker-Hochenegg-Patterson method.

It is objected that gastro-enterostomy favors the formation of a peptic ulcer, but no case of this kind was found in the author's series.

The most serious objection to gastro-enterostomy is based on the possibility that the ulcer may become cancerous. In the series reported there were 5 cases in which this was a possibility but at autopsy proof of such change was obtained in only 1 case, that of a patient who died sixteen months after the operation.

In none of the cases reviewed was the operation followed by perforation, hæmorrhage, or other ulcers. A recurrence of the ulcer developed in only 4 cases.

With regard to the objection that gastro-enterostomy does not overcome the spasmodic state of the stomach and pylorus the author states that the X-ray examination of 112 of the cases in the series reported showed rapid evacuation of the stomach contents.

To the objection that gastro-enterostomy has an effect only on pyloric ulcers or those near the pylorus

Métraux replies that good results were obtained in 96 of the 107 cases of ulcer at or near the pylorus and in 58 of the 67 cases of ulcers distant from the pylorus. The difference, therefore, was slight and it must be conceded that an operation which gives 86.6 per cent of good results in cases of ulcers distant from the pylorus is an excellent procedure.

W. A. BRENNAN.

**Serafini, G.: The Exposure of a Loop of Small Intestine under the Skin After Enterorrhaphy** (*Esteriorizzazione di un'ansa del tenue sotto la cute dopo enterorrafia*). *Arch. ital. di chir.*, 1920, ii, 339.

This article reports the case of a boy 14 years of age who was injured in a bicycle accident, the abdominal wall being torn about the level of the umbilicus and a torn loop of small intestine with a portion of the omentum being forced through the breach. The author made a pararectal incision passing through the external wound from the umbilicus toward the left inguinal region. Fætid fluid was found in the abdominal cavity. The injured intestinal loop which had ruptured transversely was brought to the surface for about 15 cm. and an enterorrhaphy was done. The loop was hyperæmic and covered with false membranes. The blood in the pelvis contained fæcaloid fluid.

After the abdominal cavity was cleansed and drained the abdominal wall was sutured with silk in three planes, a lower opening being left for two drains and an upper breach for the passage of the loop of intestine which was not replaced in the abdomen. The area was then covered with sterile gauze. On the eighth day a spontaneous evacuation occurred. The exposed loop of intestine was covered with granulations and functioned normally. On the tenth day the loop was covered with skin from neighboring areas and when the patient had sufficiently recovered he was dismissed from the hospital with instructions to return a month later. The intestine during this period functioned well. At the end of the period the exposed loop was freed of adhesions and returned to the abdominal cavity. The postoperative course was regular. The patient made a perfect recovery and is now in excellent condition.

In view of the high mortality attending surgical operations on the intestinal tract, treatment in two stages merits consideration.

W. A. BRENNAN.

**Crouse, H.: Chronic Duodenal Dilatation: Its Concomitant and Sequential Pathology.** *Arch. Surg.*, 1920, i, 538.

Chronic duodenal dilatation is a frequent pathologic condition due to the changes brought about by the upright position of the human body. The author gives a detailed description of the embryology and histology of the duodenum and compares it to the duodenum of animals. Certain experiments regarding the physiological activity of the duodenum made by a number of investigators have proved the vital importance of this structure.



The causes of chronic duodenal dilatation in the order of frequency are: ptosis of the transverse colon, a small bowel with a short mesentery producing duodenojejunal constriction, a jejunum which drops perpendicularly and causes angulation, an embryological remnant of the gastrohepatic omentum constricting the first third of the jejunum, developmental bands, diverticula of the duodenum, pathologic conditions in the head of the pancreas, and exaggerated nerve stimuli to this portion of the intestine.

The symptoms are distress in the right epigastrium coming on three or four hours after meals, belching, constipation, a rapid irregular heart beat, and auto-intoxication.

The diagnosis is made on the basis of the clinical history, the X-ray examination, tests for starch in the stools, and Einhorn tests of the duodenal contents.

The treatment of this condition is operation consisting of the correction of the etiological factors if possible and a duodenojejunostomy of the lateral type. Medical and mechanical measures, however, may give marked relief.

I. E. BISHKOW.

**Morley, J.: Clinical Manifestations of the Mobile Proximal Colon.** *Brit. M. J.*, 1920, ii, 542.

Morley briefly describes the development of the colon and the part played by the temporary mesocolon of the midgut. He compares the anatomical development of the normally fixed ascending and descending colon of man and orthograde animals with the mobile type found in pronograde animals.

In man a mobile descending colon is rare, but the ascending colon is mobile as a developmental defect in 20 per cent of persons of all ages. A woman 68 years of age was operated on for volvulus because of symptoms of obstruction persisting for three days. At operation the lower 5 in. of ileum, the cæcum, and the lower half of the ascending colon were found to be distended. These parts, which were mobile and attached to a long mesentery continuous with that of the small intestine, had undergone rotation one and one-half turns from left to right.

In discussions regarding the etiology of intussusception of the lower ileum, the cæcum, and the ascending colon emphasis has been laid on the mechanics of its production. No attention has been given to the predisposing cause, abnormal motility of the cæcum and ascending colon. Firm fixation of these as well as of the ileal band of Lane is an effective safeguard against volvulus and intussusception. In the more frequent type of chronic manifestations of these conditions complaint is made of chronic constipation and pain and tenderness in the right iliac fossa which is more pronounced on exertion after the ingestion of food; there is also a sensation of flatulence and discomfort in the epigastrium. X-ray examination after a barium meal and enema gives confirmatory evidence.

The symptoms are due to abnormal peristalsis with delay in the passage of colonic contents and the

drag of the overloaded cæcum on the ascending mesocolon. Putrefaction with chronic catarrhal colitis tends to produce toxæmia. A surgical condition, such as ulcer, cholecystitis, cholelithiasis, or appendicitis, may be co-existent and must not be overlooked.

The operative treatment of the condition is fixation of the ascending colon and cæcum in their normal position by the method of Coffey or Waugh, preferably the former. The radical operation of colectomy, partial or total, should be reserved for cases of most extreme disability and those in which the simpler methods have failed.

MERLE R. HOON.

**Sohn, A.: Spastic Ileus** (Zur Kenntniss des spastischen Ileus). *Beitr. z. klin. Chir.*, 1920, cxx, 45.

The number of positive cases of spastic ileus is still very low, about 30; biopsy is undoubtedly necessary for the diagnosis. The author reports a case, that of a nervous woman 45 years old who was brought to the hospital with a diagnosis of mechanical ileus after a five-day obstruction of the bowels and persistent vomiting which finally became of a fecal character. The small and large bowels were markedly dilated but the sigmoid colon was spastically contracted and of an anæmic color. Within the contracted bowel were found small, hard, and flattened fecal balls which at first were mistaken for a tape-worm mass. The bowel was opened and the fecal balls were removed. The mucosa was then found to be very dry but there were no ulcers, no signs of inflammation, and no foreign bodies. The spastic contraction of the bowel persisted and was not influenced in the least by deep anæsthesia.

The operation was not followed by improvement, and as no gas was passed even after the administration of morphine and atropine, it was necessary to form an intestinal fistula. Fæcal evacuation occurred through the fistula on the third day. Gradual improvement followed and ultimately the stool again passed by the natural route. The fistula was closed by operation after all the intestinal symptoms had disappeared.

Bowel spasm caused by internal or external mechanical irritation (reflex spasm) is distinct from that due to nervous causes (nervous spasm). Chief of the external causes of irritation leading to bowel spasm are dull injuries of the abdomen. Spasm following operation is due undoubtedly to small emboli from thrombosed mesenteric vessels. Internal irritation, which is much more common than external irritation, is due to the presence of foreign bodies in the intestine or inflammatory processes in the bowel wall or both. Gall-stone ileus is in reality obstruction-ileus plus spastic ileus. Spastic ileus associated with the presence of worms in the intestine is due to the irritation of chemicals contained in the intestines and genital organs of the parasites. The author does not accept Rost's hypothesis that these toxic agents become active only upon the decomposition of dead parasites in the intestine but ascribes great importance to a certain hyperexcit-



ability of the mucosa and musculature of the bowel which is manifested through the nerve plexus of Auerbach and Meissner. To the reflex spasms belong also the spastic inflammatory spasms, i.e., spasms induced by ulcerative or suppurative processes, such as the spastic hour-glass stomach, spasm of the anal sphincter in cases of anal fistula, rectal fissures and hæmorrhoids, and spasms in other areas of the alimentary canal. Related to bowel spasm and evidently a result of it is invagination.

The purely nervous spastic ileus in which a primary causative irritation cannot be discovered must be regarded in most cases as a manifestation of hysteria or neurasthenia. Differentiation of this clinical picture into a hysterical and a spastic ileus, such as Wilms desires, seems impracticable as occasionally the spastic obstruction of the bowel is only a subtype of the hysterical form. Sohn divides hysterical ileus into the pseudo-ileus, paralytic ileus, and spastic ileus, but it is often very difficult to distinguish them. Great care is necessary in accepting a history of fæcal vomiting given by a hysterical patient. Vomiting of formed fæces never occurs. Regarding the etiology of the spastic ileus of purely nervous origin little is known. It is worthy of note that the spasms are not relaxed even by deep anaesthesia and that in some cases they are found even at autopsy. The small bowel and, in the large bowel, the sigmoid flexure are most frequently involved. The duration of the spasm varies. As a rule it disappears in a few days. The theory that it is associated with paralysis of the adjacent proximal portion of the bowel is accepted by the author as in the case he reports evacuation of the bowel through a fistula made just above the spasmodic area did not occur until three days later.

The prognosis of spastic ileus is in general good although several fatal cases have been reported. The excellence of the general condition as compared with the serious clinical phenomena is frequently striking. The presence of signs of hysteria gravis or some other nervous condition suggests spastic ileus but care is necessary in order not to overlook organic disease. When the condition is dangerous an exploratory laparotomy should be performed. This may be of therapeutic value, if only on the basis of suggestion. Other therapeutic measures include, first of all, gastric lavage, the administration of opiates by mouth, by enema, and by subcutaneous injection, and other symptomatic measures. If the symptoms do not then disappear a fistula should be formed above the spasmodic area. BODE (Z).

**Van Beuren, F. T., Jr.:** The Relation Between Intestinal Damage and Delayed Operation in Acute Mechanical Ileus. *Ann. Surg.*, 1920, lxxii, 610.

Subject to certain exceptions, it might be stated as a corollary that the longer a patient lives with acute mechanical ileus before operation, the sooner he dies afterward. Van Beuren therefore urges early exploration in cases of suspected acute me-

chanical ileus. Without doubt the damage to the gut usually becomes greater the longer the obstruction persists.

Fifteen dogs were operated upon under ether anaesthesia and ileus was created by ligating or dividing the jejunum within 30 cm. of its upper end. One dog died in twenty-four hours and in 2 the ligature cut through and thus failed to cause complete obstruction.

It appears from these experiments that the third twenty-four hours is a rather critical period in the course of an acute simple obstruction not complicated by strangulation of the mesenteric blood supply. Apparently because of the intestinal distention, there occur along the antimesenteric border abnormal areas varying in color from purple to green and in size from  $\frac{1}{2}$  to several centimeters. These are areas of beginning gangrene. The greater the distention of the intestine the less the residual elasticity of its wall and vessels. As the vessels become elongated, their lumina become narrowed, their walls become thinned, and the circulation is reduced, especially at the mesenteric border. If the distention is relieved sufficiently early, the necrosis may remain superficial and healing may occur by scar formation or adhesion to other parts. If the necrosis extends through the wall, perforation and peritonitis follow.

Protocols of 6 cases are given, together with 13 illustrations showing the gross and microscopic results of over-distention of the gut. C. R. STEINKE.

**Wilkie, D. P. D.:** Acute Appendicitis and Acute Appendicular Obstruction. *Edinburgh M. J.*, 1920, n. s. xxv, 308.

The author classifies the acute diseases of the appendix into four distinct types: (1) acute inflammation of the wall of the appendix; (2) acute obstruction of the lumen of the appendix; (3) perforating ulcer of the wall of the appendix; and (4) acute inflammation with secondary acute obstruction.

Type 3 is well recognized as giving rise to a fulminant attack with peritonitis. The main purpose of this paper is to draw attention to Types 1 and 2 and to establish their fundamental differences as regards both pathology and symptoms.

The wall of the appendix, being rich in lymphoid tissue and exposed to a content full of microorganisms, is particularly liable to attacks of inflammation. Primary inflammation is usually associated with malaise, a certain rise in the temperature and pulse rate, nausea or vomiting, and more or less severe pain in the lower abdomen which gradually becomes localized on the right side. The appendix, being a hollow viscus, is subject also to obstruction. When this occurs, the symptoms which follow are entirely distinct from those associated with simple inflammation and more striking.

In experiments to determine the difference in the symptoms of appendicitis of Types 1 and 2 the cat was chosen as the experimental animal as it is a



mixed feeder and possesses a muscular intestinal wall. An artificial appendix having been made by isolating the last coil of the ileum and then restoring the continuity of the intestinal tract, a rubber ligature was tied around the proximal end of the appendix without disturbing the blood supply. When the appendix was left empty under these conditions a mucocele was formed; when it contained a small amount of faecal matter an empyema resulted which finally ruptured; and when it contained a considerable amount of faecal matter, gangrene rapidly ensued. The close resemblance between the pathologic changes observed in these experiments and those noted in certain cases of acute appendicular disease in the human subject seems to warrant the assumption that obstruction is the primary factor in both.

The causes of acute appendicular obstruction are, first, the impaction of a concretion either in a stenosis due to previous inflammation or in a kink due to an adhesion or a congenital fold in the peritoneum, and second, tumors at the proximal end of the appendix.

In some cases the symptoms may set in suddenly. In most cases, however, a history of intermittent colicky pains or of "bilious attacks" with pain in the right lower quadrant may be obtained. The acute attack begins suddenly with severe pain in the umbilical region which is frequently associated with vomiting. The pain is of an acute colicky nature, and in the beginning is intermittent, coming on in spasms. After a time it becomes constant and is aggravated by more acute spasms from time to time. Perforation is followed by relief from pain but by an increase in the pulse rate and temperature and a somewhat anxious expression. Examination reveals cutaneous hyperaesthesia in McBurney's region, muscular rigidity, and tenderness on pressure.

When obstruction supervenes upon a simple inflammation, the pain becomes more acute with characteristic spasmodic exacerbations.

The author concludes:

1. Primary acute inflammation and primary acute obstruction of the appendix are distinct pathological and clinical entities.

2. Complete obstruction of the lumen of the appendix near its caecal end is followed by changes which depend on the presence or absence of faecal matter in its lumen. Obstruction of the empty appendix leads to mucocele. If little faecal matter is present an empyema is formed. If much faecal matter is present gangrene and perforation result.

3. In order that cases of obstruction may be recognized in their early stages the state of the temperature and pulse rate must be ignored and stress laid entirely on the facies and the local examination of the abdomen.

LOUIS HANDELMAN.

**Pauchet, V.: The Signs and Treatment of Rectal Cancer** (Signes et traitement du cancer du rectum). *Presse méd.*, Par., 1920, xxviii, 705.

Pauchet states that of every three patients with rectal cancer who consult a surgeon one will be

inoperable, one may be treated only by a limited operation by the perineal route, and one may be subjected to a radical operation by the abdominal route.

Wide exeresis of the intestine, the cellular tissue, and the glands is often followed by a prolonged cure. The prognosis depends, however, upon the diagnosis of the first physician consulted by the patient.

Three methods of treatment are applicable to cases of rectal cancer: (1) in favorable cases, an abdominoperineal extirpation; (2) in cases in which the condition is limited, perineosacral extirpation in two stages; (3) in inoperable cases, the formation of an iliac anus and treatment with radium.

The treatment of choice is abdominoperineal extirpation in one stage with extensive removal of the perineal and pelvic tissues. A wide perineosacral exeresis also gives good results.

The formation of a perineal anus is associated with great operative risk and is apt to be followed by recurrence. In many cases the anus closes or is insufficient. In making an iliac anus Pauchet twists the intestine 180 degrees and passes it through a buttonhole opening made in the great rectus or oblique muscles which are to form the new sphincter. After a few months an anus formed in this way is under the control of the will.

Radium should be used for from eight to fifteen days before any operation.

W. A. BRENNAN.

**Drueck, C. J.: Cancerous Obstruction of the Rectum.** *Internat. J. Surg.*, 1920, xxxiii, 349.

Rectal cancer is variable in its obstructive symptoms. Sometimes scirrhus cancer which has narrowed the lumen to a marked extent will cause little or no obstruction. Ulceration may begin early and the sloughing of the growth is sufficient to keep the passage open. When obstruction is present in the lower rectum or the anus the faeces are ribbon-like or in the shape of pea-like balls. Clinically the obstruction resembles simple stricture. In cases of encephaloid cancer the passage of faeces is not so frequently interfered with because of early ulceration and sloughing. Ulceration into the surrounding tissues allows the extravasation of faeces and often a large dissecting abscess or fistula is formed. Digital examination is of great value in the diagnosis.

Rectal cancer is rarely situated on the front wall of the rectum alone. As a rule the ulceration spreads to the front and side walls and forms a raised patch. A crater-like depression may be felt with the finger. Usually the slightest touch causes extreme pain and exaggerates tenesmus. A short finger may not reach a cancer high up, but when the patient is thin the lower limit may be reached by pulling down the anus and pushing in the suprapubic region. The presence of a hard, irregular, and rough mass on one side of the rectum easily differentiates the condition from simple stricture.

The most common type of rectal cancer is the scirrhus cancer. This usually occurs above the



internal sphincter or in the ampulla of the rectum and as a rule begins on the anterior wall. It arises as a hard nodular mass and extends in a circular direction until it has involved the whole circumference of the rectum, leaving only a small opening in the middle. It grows lengthwise very slowly and rarely involves an area more than 2 in. long.

The encephaloid cancer occurs as a soft polypoid mass very like a benign adenoma but has a broad base which infiltrates into the submucous tissue. It breaks down very early. On palpation, irregular masses appear to have been broken off roughly. Raised edges surround the ulcer, giving it a crater-like appearance.

Cancers high in the rectum and in the sigmoid are the most difficult to diagnose. The rectoscope is valuable in the diagnosis and the roentgen examination is indispensable. The most important finding is the filling defect. This must be differentiated, however, from spasm, fæces, intestinal gas, adhesions, extrinsic pressure, diverticulitis, tuberculosis, actinomycosis, syphilis, and benign tumors of the bowel.

I. W. BACH.

**Richter, H. M.: A New Operation for Prolapse of the Rectum in Women.** *Surg., Gynec. & Obst.*, 1920, xxxi, 526.

The procedure described is as follows:

Through a median incision the uterus is drawn up and the broad ligaments, including the round ligaments and tubes, are severed close to the uterus. The rectum is pulled up taut and its anterior surface sutured to the posterior vaginal and cervical walls. The mesorectum is then perforated and the broad ligaments are pulled through this opening and sutured together. The pelvic space is obliterated by suturing the uteropelvic ligaments to the rectum and the free borders of the broad ligaments to the posterior pelvic peritoneum. The uterus is then sutured to the free border of the abdominal fascia and the anterior surface of the fascia. In this way firm extrafascial fixation of the uterus is obtained. The rectum is further sutured to the free edges of the abdominal fascia for a short distance. The incision is closed in the usual manner.

This operation has a limited field as it can be performed only when the uterus and broad ligaments may be utilized for the suspension and therefore is applicable only after the child-bearing period or to cases in which sterilization is permissible.

I. E. BISHKOW.

**Martin, E. G.: Hæmorrhoidectomy: A Composite Operation.** *J. Am. M. Ass.*, 1920, lxxv, 1475.

Free catharsis and a light diet are prescribed during the twenty-four hours before the patient enters the hospital and a good night's rest is assured by the administration of a mild hypnotic. Following an enema on the morning of operation, two doses of morphine,  $\frac{1}{4}$  or  $\frac{1}{6}$  gr., and scopolamine, 1/200 gr., are given, the first, one hour, and the second, one-half hour, prior to the operation.

With the patient lying in the left lateral Sim's position on a comfortable mattress, the buttocks, peri-anal, and anal regions are thoroughly cleansed with soap and water followed by the application of iodine, alcohol, and sterile water.

**Step 1.**—The buttocks are retracted by an assistant, and a 1 per cent solution of sterile procaine or its equivalent is injected under the skin about  $1\frac{1}{2}$  in. posterior to the anus, the injection being continued as the  $2\frac{1}{2}$  in. needle penetrates deeply into the sphincter and laterally, where about  $\frac{1}{2}$  oz. of the solution is deposited. The needle is then withdrawn, and similar injections are made into the opposite side of the sphincter. Again, with the needle nearly withdrawn, the subcutaneous and submucous areas are injected under the hæmorrhoids and around the anal canal. This last injection, done deliberately and without distending or distorting the field, is carried with the long needle laterally on each side of the anus to the anterior quadrant. By this technique, the sensory nerves supplying the anal sphincter, anal canal, and peri-anal skin are desensitized and complete anæsthesia is obtained. The anal sphincter is then ready for any necessary dilatation and an undistorted operative field presents the hæmorrhoids for radical removal.

**Step 2.**—After dilatation, which is a matter of choice and is effected as an aid to further preparation, a bivalve speculum is introduced and the rectum is thoroughly mopped out with a 0.5 per cent cresol solution. Following this, a dry sponge is placed beyond the internal sphincter to prevent soiling of the operative field. An anal retractor may now be used, if desired, to obtain better vision. The hæmorrhoid is carefully grasped with the battle-axe forceps and drawn out tensely, care being taken not to traumatize the anal mucous membrane and skin unnecessarily.

**Step 3.**—An artery forceps is clamped above the hæmorrhoid and the battle-axe forceps is substituted for a sharp-toothed dressing forceps to facilitate more accurate treatment when the redundant part of the pile is cut away. The toothed forceps again being employed, all hæmorrhoid tissue below the anal surface in this region is dissected out with pointed lateral curved scissors.

The author applies the term "pile" to the tumor, and the term "hæmorrhoid" to the tumor plus any and all hæmorrhoid structure below the anal surface.

**Step 4.**—If the blood supply has not been controlled by the artery forceps, as evidenced after the removal of the hæmorrhoid, a second pair of forceps is placed to control it before the catgut ligature is introduced and tied above. The catgut is introduced either with a blunt needle or a ligature carrier. It is permissible, however, to use a sharp-pointed needle, but with this there is danger of puncturing a blood vessel. The ligature may be introduced with a ligature carrier after the pile is first grasped and drawn down and before the hæmorrhoid is removed. The author has found that very often



with this method it is necessary to introduce a second suture to control the bleeding, and therefore suggests the use of the forceps to assure hæmorrhage control before ligation. Emphasis is placed upon the fact that no suturing is done for approximation. The technique described is carried out successively for each hæmorrhoid, after which the parts are sponged, the gauze is removed from the rectum, and a small rubber tube about  $\frac{1}{4}$  in. in diameter is inserted through the anal canal into the rectum. This tube drains any accumulation of fluid from the rectum, and should be removed, for the patient's comfort, at the end of the day.

Postoperative pain is satisfactorily controlled by the hypodermic administration of  $\frac{1}{6}$  gr. of morphine repeated every three hours for six doses. Barring contra-indications, it is used routinely. Light fluids are given for three full days, after which the bowels are opened by a warm oil enema followed in one-half hour by a saline enema. The use of soap is avoided. Following evacuation, hot sitz baths are of value and are much appreciated by the patient. Daily saline enemas are prescribed until the anal distress moderates, after which mild cathartics are depended upon. The desirable stay in the hospital is five days.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Cignozzi, O.:** A Contribution to the Surgery of the Liver and Bile-Ducts (Contributo alla chirurgia del fegato e delle vie biliari). *Arch. ital. di chir.*, 1920, ii, 378.

Cignozzi reviews 80 cases of hepatic or biliary lesions, 78 of which were treated by operation. There were 73 recoveries and 7 deaths. The operations included 33 hepatostomies for echinococcal cysts, etc.; 24 cholecystectomies for gall-bladder calculi; and 5 cholecystectomies for non-calcareous gall-bladder lesions.

The 32 cases of echinococcal cysts in the liver demonstrated the importance of eosinophilia in the hæmatologic findings. Eosinophiles were found in the blood in 90 per cent of the cases, being absent only in cases of suppuration in which polynucleosis was noted. In from 60 to 70 per cent of the cases operated upon the temperature was of a febrile type and showed a definite morning remission. It often remained thus for two or three weeks until the cystic membranes were eliminated. In the most severe cases the author obtained good results from serotherapy.

Twenty-six cholecystectomies for gall-bladder calculus were followed by recovery in 24 cases and by death due to peritonitis in 2. The author has always recommended drainage of the remaining cholecystic area and broke this rule in only 5 instances. The 2 deaths from peritonitis he believes were due to insufficient drainage which favored infection of the serosa of the cystic stump. W. A. BRENNAN.

**White, C. S.:** Cholecystgastrostomy. *Surg., Gynec. & Obst.*, 1920, xxxi, 493.

Cholecystgastrostomy or anastomosis between the gall-bladder and the stomach has a limited application. It is of value, however, in certain forms of cirrhosis of the liver. This condition can be conveniently and logically divided into two types, portal and biliary. In portal cirrhosis cholecystgastrostomy offers no relief. Biliary cirrhosis, in which it has its chief indication, is due to congenital deformity or obliteration of the larger gall-ducts, gall-stones or contractions of scar tissue, cancer of the head of the pancreas, enlarged glands at the hilum of the liver, or ascending infection chiefly from the gall-bladder. Infection within the bile-ducts eventually leads to thickening and blocking with dilatation of the smaller bile-ducts, dilated blood vessels, and cirrhosis of the liver. The latter may be interlobular, intralobular, or pericellular. Obstructive biliary cirrhosis is characterized by digestive discomfort, gradually increasing jaundice, loss of weight, putty stools, and an afebrile course. Simple drainage often will arrest the inflammatory activity in the ducts, but must be continued over a long period of time. Cholecystostomy accomplishes much but the fistula with its uncertain period of drainage, the tendency of the wound to heal and discharge at irregular periods, the necessity for frequent dressings, and irritation of the skin are unpleasant features.

The technique of cholecystgastrostomy is similar to a miniature gastro-enterostomy. The gall-bladder and anterior pyloric end of the stomach are approximated for a distance of about  $1\frac{1}{4}$  in. by a Lembert suture of fine chromic catgut. Parallel to this line of suture an incision about  $\frac{3}{4}$  in. in length is made in the stomach and gall-bladder, the edges of which are approximated by a glover's or locking stitch of No. 00 chromic catgut so that the two openings are converted into a fistula between the stomach and gall-bladder. The anastomosis is then re-enforced with omentum. The stomach and thickened walls of the gall-bladder will permit deep bites with the needle and a rubber dam may be used from the cholecystgastrostomy to the surface of the abdomen. The Murphy button may be substituted for the suture method of anastomosis but is open to serious objection as ulceration and perforation due to its retention in the gastro-intestinal tract have resulted in death.

R. R. MUSTELL.

**Barron, M.:** The Relation of the Islets of Langerhans to Diabetes, with Special Reference to Cases of Pancreatic Lithiasis. *Surg., Gynec. & Obst.*, 1920, xxxi, 437.

Pancreatic lithiasis is a very rare disease which occurs usually in males during the fourth decade of life.

The obstruction of the pancreatic duct leads to advanced atrophy of the pancreas associated more or less with fibrosis. The islets may remain intact even when the acini disappear completely. The islets



are epithelial structures which are entirely independent of the acini and have no relation to, or communication with, the ducts. Changes in the islets, such as degeneration, necrosis, and fibrosis, generally occur late in the disease and are probably the result of a superimposed secondary infection consequent to prolonged stasis in the ducts.

In complete accord with the results obtained experimentally in animals, occlusion of the ducts by calculi in man is not followed by diabetes mellitus unless the islets are injured.

Cases of pancreatic lithiasis presenting symptoms of hyperglycemia and glycosuria reveal definite lesions of the islets at autopsy.

The principal clinical findings in cases of pancreatic lithiasis are colic-like epigastric pains often associated with temporary glycosuria, steatorrhea, alimentary glycosuria, incomplete digestion of meat fibers as revealed by the persistence of the nuclei in muscle fibers in the feces, and, occasionally, the presence of whitish or grayish pancreatic stones in the feces. The late stages are often associated with diabetes mellitus.

Operations on the pancreatic duct are often successful. The danger of fat necrosis due to the escape of pancreatic fluid appears to be negligible.

H. A. McKnight.

**Fowler, R. H.:** Surgical Jaundice; Report of a Case of Primary Carcinoma of the Pancreas. *Med. Rec.*, 1920, xcvi, 767.

Surgical or non-hepatogenous jaundice due to obstruction to the biliary flow between the liver and duodenum is caused by trauma, inflammation, or new growth of the walls of the hepatic or common duct or by pressure due to external inflammation or neoplasms. The primary new growths causing obstructive jaundice are carcinoma of the gall-bladder, the common duct or ampulla of Vater, the duodenum or the papilla of Vater, and the pancreas or pancreatic duct.

The author discusses primary carcinoma of the pancreas and summarizes the literature on this subject as follows:

Carcinoma, the most common new growth in the pancreas, is found in about one-half of 1 per cent of autopsies. Sixty-three per cent of such growths occur in males. The condition has been found in infants, children and young adults. As a rule the neoplasm occurs in the head of the pancreas, is small and circumscribed, and, in the absence of metastases, cannot be distinguished by palpation from chronic pancreatitis.

Clinically, jaundice is common in carcinoma of the head of the pancreas. When the growth is situated in the body, pancreatic obstruction may occur without biliary stasis, and involvement of the portal circulation may produce ascites and oedema. Glycosuria indicates involvement of the islands of Langerhans.

Anastomosis between the biliary system and the gastro-intestinal tract is indicated in a limited

number of cases of obstructive jaundice as by this means life is definitely prolonged. Anastomosis with the stomach does not injure gastric digestion or cause discomfort. The danger of infection is not greater in cholecystjejunostomy than in cholecyst-gastrostomy. Cholecystocolostomy is not justifiable.

The author's case, that of an unmarried woman 37 years of age, was seen six months after the onset of symptoms consisting of heartburn, belching of gas, a sour taste in the mouth, epigastric pain, and vomiting followed by steadily increasing jaundice and itching of the skin. At operation at this time free bile-stained fluid was found in the abdomen. The head of the pancreas was of stony hardness and much enlarged. There was no metastasis.

Chronic pancreatitis was suspected and the gall-bladder was drained. The drainage persisted. After two months a cholecystoduodenostomy was performed. The patient recovered from the operation but died two months later. Autopsy revealed adenocarcinoma of the head of pancreas with metastasis in the liver.

The author concludes that in cases of obstructive jaundice an exploration is indicated. Chronic pancreatitis is difficult to diagnose. As a palliative measure anastomosis with either the stomach or the duodenum is of value.

R. C. Webb.

#### MISCELLANEOUS

**Orth, O.:** Chronic Traumatic Hernia of the Diaphragm and Its Surgical Significance (Die chronisch traumatische Zwerchfellhernie und ihre chirurgische Bedeutung). *Beitr. z. klin. Chir.*, 1920, cxx, 89.

The author has observed 4 cases of traumatic hernia of the diaphragm. In 2, strangulation had occurred when the patient was first seen. In both instances the herniated colon was completely gangrenous and death resulted. Of the other 2 patients one was cured and the other died ten weeks later of influenzal pneumonia after he had survived a severe attack of pyothorax. Both of these patients had been operated on previously elsewhere.

The incarcerated organs were: (1) the omentum and colon; (2) the omentum, stomach, colon, and spleen; (3) the omentum, stomach, small intestine, and large intestine; and (4) the omentum, stomach, colon, and spleen.

In the formation of diaphragmatic hernia several factors are involved. First of all the omentum enters the opening and prevents union of the edges. This is followed by the formation of adhesions with the thoracic organs and upon contraction of these adhesions the abdominal organs are dragged upward. In addition, the pleura has a decided tendency to the formation of exudates and the intraperitoneal pressure is increased. Of no little importance also is the constant suction due to the negative pressure in the thoracic cavity.

The stomach and colon are the organs more commonly herniated, the spleen and small intestine being involved less frequently. In many cases the



herniated organs are twisted as much as 180 degrees. The severe nutritional disturbances of the colon are easily explained by this incarceration and torsion. Because of the rich blood supply and the thickness of the stomach wall, however, these phenomena alone do not explain the gastric ulcers observed in these cases. The author believes that such lesions are due to strangulation of large parts of the omentum.

In the early stages pleuro-pneumonic and cardiac symptoms are noted. These are often followed by a painless interval and then by gastro-intestinal symptoms (a feeling of fullness, dysphagia, vomiting, etc.). Objectively in the beginning only the signs of thoracic injury are observed (hæmothorax, empyema, etc.). Later tympanitic sounds are noted on auscultation and percussion. The introduction of fluid into the stomach produces a rushing sound to the left of the heart. Shoulder pain due to irritation of the diaphragm is often present. The most important aid in the diagnosis is the X-ray. Air spaces in the thoracic cavity, retraction of the lung and elevation of its lower border, and shadows due to the misplaced organs are observed. The patient should be examined with the fluoroscope after a bismuth meal and while lying on his side so that the bismuth line will be at a right angle to the line of the diaphragm.

Because of the incarceration the prognosis is grave. Early diagnosis will decrease the present high operative mortality (50 per cent).

Radical operation alone is to be considered in the treatment and for this the author urges the use of the abdominal route. The best exposure is obtained by an incision which begins at the edge of the rib at the end of the xiphoid cartilage, divides the rectus muscle, and enters the intercostal space between the ninth and tenth ribs without opening the pleura. If the operation is done under increased pressure the great distention of the lung will prevent the formation of a pneumothorax and decrease the exudate formation, thus considerably lessening the danger of infecting the pleura. The tear in the diaphragm

should be sutured; plastic covering is usually unnecessary. To decrease the tension of the diaphragm temporarily during the operation the phrenic nerve may be divided. Pyopneumothorax which unfortunately is a not uncommon complication should be treated by the suction method of Perthes.

DEUS (Z).

**Huber, F.: Lambotte-Handley Drainage in a Case of Chylous Ascites; Second Report. *Arch. Pediat.*, 1920, xxxvii, 600.**

Good results have been obtained by draining the ascitic fluid through the opening between the fascial layers of the thigh where it is gradually absorbed in the connective tissue of the thigh and anterior abdominal wall.

The case reported was that of a boy 8 years of age with a negative history, negative urine, and negative blood, von Pirquet, and Wassermann tests, but with marked œdema of the penis, both thighs, and the anterior abdominal wall. An exploratory laparotomy was done and 2,000 c. cm. of ascitic fluid were withdrawn. The small intestines were pale and distended and the lacteals and lymph glands were markedly engorged. The Lambotte-Handley plan of drainage was decided upon and six strands of No. 7 white silk 4 in. long were grasped in a narrow blade forceps and thrust through the peritoneum to the outer side of the femoral vessels in the thighs and at the upper angle near the umbilicus. Care was taken not to leave the projecting strands of silk too long as this might cause attachment of the omentum or obstruction. Five months later examination revealed no abnormality of the abdomen and the patient was in good health.

Interference with drainage may be followed by recurrence of ascites. A glass drain usually permits too great a flow and acts as a foreign body. Calf aorta hardened in formalin does not act as a foreign body. Care is necessary not to make the outlet too large as in such case there is danger of the development of a hernia.

R. R. MUSTELL.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Morse, P. F.: The Peroxidase Reaction in Three Cases of Multiple Myeloma of the Bones, with Remarks Concerning the Nosological Position of These Tumors. *J. Cancer Research*, 1920, v, 345.**

The exact pathologic characteristics which permit the classification of a tumor in the myeloma group have never been uniformly agreed upon. From the clinical point of view the cases are fairly well defined. The presenting symptom which brings the patient to the clinic is usually deep-seated pain of a constant and distressing character associated with marked weakness and cachexia, and occasionally with conditions leading the physician to the

consideration of organic disease of the spinal cord. The physical examination usually discloses severe emaciation, loss of weight, and anæmia. On careful examination of the osseous system it is found that as a rule the bone tumors are most evident in the ribs. In many cases, however, their presence in the long bones is revealed by pain or spontaneous fracture. The X-ray leaves no doubt regarding the condition as circumscribed or diffuse bony tumors are discovered in practically all parts of the body. The urine sometimes contains the Bence-Jones albumose. The relatively rare occurrence of the disease and the present hopeless prognosis are responsible for the fact that interest has been centered chiefly in the histologic pathology of the tumors and their nosological relationships.



The term "multiple myeloma" was first used by von Rustizky who regarded the condition more as a hyperplasia than a neoplasm and believed that the characteristic cell was a marrow cell. He took this stand because of the general resemblance, both gross and microscopic, between the tumor and marrow tissue. The detailed histology of the marrow had not then been sufficiently developed for a detailed microscopic study of the cellular elements involved.

On account of the fact that some cases reported as examples of myeloma have apparently been of the lymphocyte type, such as that of Herrick and Hektoen, there has been a tendency in the later literature to limit the use of the term "myeloma" to tumors having a characteristic histology.

The oxidase reaction is an addition to the methods of studying these tumors and may be applied to each new case observed. The author states that a negative reaction does not prove the tumor to be of non-myeloblastic origin, and that he has been unable to find proof in the literature that cells of the marrow other than the myelocyte series have not acted positively to the oxidase reaction. The lymphocyte series have reacted negatively and the more differentiated members of the myelocyte series have acted positively under normal conditions. While on these grounds it was not considered logical to resort to this technique to decide the origin of a circulating blood cell, it was quite another and unjustified leap of logic to assume that in the bone marrow no cells but the myelocyte series will give the peroxidase reaction even under pathologic conditions. The point is that while the latter assumption may be true, the question has not been studied. In other words, the peroxidase reaction applied to myelomata has given interesting information, but until our knowledge of bone-marrow histology is more definite, nothing can be actually settled by applying this reaction to a particular case. Morse considers very important Mallory's point of view that these tumors do not consist of cells of the myelocyte series because they do not differentiate in the same way. He summarizes his article as follows:

Three cases of non-oxidase reacting myelomata have been reported.

The histogenesis of these tumors has been discussed and data have been presented which were interpreted as supporting the theory that the so-called "plasma cell" type of myeloma is not of myeloblastic origin and has no relation to the leucemic group:

It has been suggested that the "plasma cell" myeloma springs from a series of cells the specific function of which is bone absorption, and that the myeloma cell might be a heteroplastic "osteoblast."

The finding of abnormal cell types in the peripheral blood of patients with myelomata has not been demonstrated by the published examples to be specific and characteristic of this form of tumor. The myelocytes, "plasma cells," and other abnormal cell types, together with varying degrees of leucocy-

tosis and disturbances in the percentage relationships of the various normal leucocytes, have been adequately accounted for by the condition of malignancy accompanied by widespread bone-marrow involvement and have been found in non-myelomatous conditions.

G. E. BEILBY.

**Terracol, J., and Colanéri, L. J.: Pneumo-Serosa of the Joints** (*La pneumo-séreuse articulaire*). *Presse méd.*, Par., 1920, xxviii, 655.

During the recent war cases of joint injury were frequently examined with the X-ray after insufflation of the joint cavity. The authors' experience with this method has been limited to cases of hæmo-hydrarthroses, hydrarthroses, and other conditions not due to infection. They prefer the injection of sterile atmospheric air rather than oxygen gas which has been used by others. The air is filtered through a small tube of sterile cotton. Before its injection the fluid in the joint is withdrawn as a mixture of fluid and air results in a hydro-pneumo-arthritis which clouds the radioscopic picture. A hypodermic needle is employed. If the fluid accumulated in the joint necessitates the use of an instrument of larger caliber, the operation is performed in two stages, the injection being made the first or second day following the evacuation of the joint cavity. The injections are measured by means of a Luer graduated syringe or a Potain pump.

In the case of the knee joint the injection is made at the upper external angle of the patella. In the X-ray picture following insufflation the bone surfaces are seen in sharp relief. The ligaments and menisci are discerned quite clearly when the patient is in ventral decubitus with the patella against the plate and the leg slightly flexed.

The meniscus is best examined with the patient in dorsal decubitus with the popliteal fossa against the plate and the leg extended. The articular membrane is well defined, pockets and other peculiarities being shown in profile. At the articular interline the injected air acts like a fluid, tending to separate the bone surfaces of the joint. This interline has been observed also in cases of laxness of the joint.

The findings in other joints are also described. The authors conclude that the method should be employed more generally. While today it is of value primarily in the diagnosis, ultimately it may be of therapeutic importance. W. A. BRENNAN.

**Basset, A.: Is There Such a Condition as Contusion of the Hip?** (*La contusion de la hanche; existe-t-elle?*) *Presse méd.*, Par., 1920, xxviii, 867.

The author does not believe that there is such a condition as contusion of the hip because he has never observed it. He states that in the cases classically described as cases of this kind there is always a bone lesion. In the great majority of cases this lesion is a complete fracture of the neck of the femur and is almost always a true cervical fracture. In a few cases it is an incomplete fracture



of the neck of the femur, and in still fewer, a traumatic lesion of the femoral head or condyle.

Without an X-ray examination a diagnosis of contusion of the hip is unwarranted. The author quotes several case histories to support his views.

W. A. BRENNAN.

### FRACTURES AND DISLOCATIONS

**Schrock, R. D.: Early Active Motion in Intra-Articular Fractures.** *J. Am. M. Ass.*, 1920, LXXV, 1320.

The rapidity of absorption of hæmatomata in the fascial planes and muscles determines the amount of residual new cicatricial tissue formed in these structures, the ratio being inverse. Any measure promoting absorption will decrease the permanent damage.

The hæmorrhagic and plastic exudates will often practically obliterate the peri-tendon space. Prolonged immobilization results in troublesome adhesions. Even slight motion, if begun early, is a certain preventive measure.

The thickened portions of capsular ligaments are never torn across. Hæmarthrosis is taken care of by the synovial membrane. If the capsular ligament is torn at any joint — as is always the case in a linear fracture extending into a joint — the synovia shares the same fate. If early motion is possible, extrusion of blood from the joint into the soft parts will be accomplished more rapidly and the synovia will be enabled sooner to resume its normal function of secretion. Residual fibrin, especially in the borders and pouches, becomes so well organized in a week or ten days that it causes uncomfortably firm adhesions between the adjacent synovial surfaces, and in eight or ten weeks, if undisturbed, gives permanent fixation of the synovia.

Proper reduction of this type of fracture is as essential as in diaphyseal lesions. The cases in which the fragments are rotated and seemingly blocked in malposition are at once to be classed with those in which the open operation is best, but closed reduction under complete anæsthesia often will give surprising results. Functional reduction and not necessarily anatomical reduction is the end in view.

Splinting is essential and should be protective rather than destructive. Absolute immobility is neither necessary nor comfortable.

Active contraction of muscle groups is begun in the dressings the second and third days. Slight active motion can be made the fourth or fifth day. By the tenth day motion should be up to half normal. After the third week a splint should be applied only at night, and after four weeks no splint at all should be used.

These methods present the disadvantages of requiring more time and personal attention on the part of the surgeon, either in the daily personal care or in the instruction of office assistants. They require also more time and attention on the part of the patient.

The advantages are summed up as follows:

1. The mental relief of the patient when he sees the joint in motion. His vision of a stiff joint is dispelled early and co-operation is all the more hearty.
2. There is little danger from poorly applied or ill-fitting methods or fixation.
3. Ischæmic paralyses with their disastrous outcome are avoided.
4. Muscle tonus and volitional control of muscles are maintained.
5. Temporary pathologic changes in the muscles are more quickly overcome, and the persistent fibrous degenerations are avoided.
6. There is less chance of calcareous degeneration in muscles and ligaments about the joint.
7. There is less chance of a complication of plastic adhesive synovitis and the residual crepitating joint.
8. Absorptive changes in the bone and decalcification from disuse are reduced to a minimum, if not entirely avoided.
9. There is less danger of fibrous or bony ankylosis.
10. The too-frequent procedure of breaking up adhesions under anæsthesia with repeated injury to the soft parts and increased functional damage is obviated.
11. The additional two or three weeks normally consumed in limbering up the joint and strengthening the part become unnecessary.
12. The period of disability is shortened.

C. R. STEINKE.

**Stern, W. G.: Dislocation of the Carpal Semilunar Bone.** *J. Am. M. Ass.*, 1920, LXXV, 1389.

The semilunar is the bone of the carpus which is most frequently dislocated, and its dislocation is a common cause of persistent disability following injuries to the wrist.

Reduction can be effected and maintained with good functional results. Excision is preferable only in late and neglected cases.

The author describes the mechanism and pathology of the dislocation and then gives in detail his method of reducing it with the aid of a Thomas wrench. He concludes:

1. Dislocations of the carpal semilunar bone are not infrequent, and in uncomplicated cases reduction is possible as a rule if treatment is given reasonably early.
2. More frequent use should be made of the roentgen ray in diagnosing injuries about the wrist joint. The presence of a "sprain" as well as a definite fracture should be confirmed by this means.
3. In early cases an attempt at bloodless reduction of the dislocation by means of over-extension and the Thomas wrench under complete anæsthesia should be made.
4. The reduced semilunar bone should be held in place by fixation in extreme flexion.
5. Physiotherapy should be used early and continued until function is restored.
6. Old, intractable dislocations or severe fracture dislocations should be excised.

K. L. VEHE.



**Buchanan, J. J.:** Reduction of Old Dislocations of the Hip by Open Incision. *Surg., Gynec. & Obst.*, 1920, xxxi, 462.

The author has collected and tabulated 50 cases of old traumatic dislocations of the hip which have been reduced by open operation. The first operation was performed by Polaillon in 1882 and the last, the author's, in 1919. Buchanan considers four weeks as the period in which a hip dislocation becomes old as by the end of that time the acetabulum is filled with a mat of fibrous tissue, the head and neck are bound down with tissue of the same kind, and the muscles are shortened.

Of the 50 operations, only 3 proved fatal, the cause of death in every case being septic complications. This is a favorable showing for an operative procedure which has always been regarded as very grave.

Twelve of the operations were done on children 10 years of age or younger, and 12 on young persons between 10 and 20 years of age.

In 25 cases the dislocation had been present for from one to three months, and in 1 case (Murphy's case) the head had been out for sixteen years.

In 17 cases the dislocation was not recognized until it had become old. In 17 others it probably had not been recognized at all as no early trials at reposition were recorded. In 11 cases trials were made and abandoned.

As regards 38 cases it is definitely stated that the acetabulum was filled with a mass of connective tissue. It was empty in only 1 case. Access to the head and acetabulum was usually gained by Langenbeck's, Barker's, or Kocher's incision.

In the author's case, which was of seven months' standing, the head was reduced by manipulation and traction, an apparatus devised by Buchanan and levers being employed.

The functional result was ideal in some cases and good in 80 per cent. In 20 per cent it was not satisfactory.

The conclusions arrived at by Buchanan are:

1. The operation is a favorable procedure and when performed by modern methods is attended with little danger.
2. The reduction is usually difficult, but in most cases may be accomplished by properly planned and persevering effort.

#### SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Hamilton, G.:** Cortical Inlay Bone Graft Emplaced under Pressure. *Texas State J. M.*, 1920, xvi, 210.

As the result of the recent war the operation of bone grafting has acquired greater importance. Heretofore bone grafts were used mainly to bridge over fracture lines in cases of non-union. In war injuries it became necessary to bridge over gaps due to loss of bone substance.

The first step of the operation consists of carefully resecting all scar tissue and closing the wound accu-

ately. This is done as a preliminary step because scar tissue harbors bacteria and breaks down easily and a bone graft embedded in scar tissue tends to atrophy and fracture. In the next step of the operation the ends of the bones are exposed, the tissue between the fragments being left intact. The muscles are then stripped from the bone for about 2 in. from the fractured ends and for about one-half of the circumference of the bone. Next, beginning about 1 in. from the fracture end, an oblique saw cut is made about one-third through the bone, in a direction away from the point of fracture and at an angle of a little less than 45 degrees, the piece of bone between the end and the saw cut being removed with a sharp osteotome. The same procedure is repeated in the other fragment. In this way the medullary canal is exposed and a bed with overhanging ends is prepared for the graft.

Extension is now made on the limb, and with a pair of calipers the length of the bone defect is ascertained and, the antero-internal surface of the tibia having been exposed, the length of the graft is marked on the periosteum with a knife. The graft removed is made about  $\frac{1}{2}$  in. longer than the defect it is to bridge. Its width should correspond to that of the bone in which it is to be placed. A motor saw is used to cut the sides of the graft and to mark the ends. With a chisel, the ends are cut in such a way as to leave them beveled at an angle of 45 degrees. The graft is then lifted from its bed and emplaced in its new bed by setting in one end and extending the limb and levering with an osteotome at the other end. In this way it is received so that, with the release of extension, the overhanging ends of the bed grasp and fix it firmly. Kangaroo tendon is now passed around the graft and bone near each end and tied tightly.

The growth of bone is dependent on function. A bone graft under end pressure is functioning from the moment it is inserted. As soon as the blood supply is established osteogenesis begins and the graft grows rapidly. The method described gives an extensive surface of contact between the freshened bone and the graft and the medullary surface of the graft covers the opening into the medullary canal.

LOUIS HANDELMAN.

#### ORTHOPEDICS IN GENERAL

**Gore, V. M.:** Talipes—A Plea for Early Treatment. *J. Oklahoma State M. Ass.*, 1920, xiii, 387.

The author attributes the prevalence of club-foot deformities to: (1) the fact that physicians often neglect to inform the child's parents that these conditions may be corrected if treatment is given at the proper time, and (2) incomplete treatment.

Congenital cases are treated best when the child is three months old, the treatment being continued until a month or more after it has learned to walk and has walked with the foot in the overcorrected position.

Tenotomy should not be performed until every deformity except equinus is corrected.



Osteotomy performed before the child has walked the author considers gross malpractice.

In paralysis early prevention is paramount. Later the procedure chosen should be that which offers the greatest stability of the foot and the nearest approach to normal, whether this be an osteotomy or the arthrodesis of Whitman or Jones.

R. V. FUNSTON.

**Harrigan, A. H., and Boorstein, S. W.: The Orthopedic Treatment of Burns.** *Ann. Surg.*, 1920, lxxii, 616.

The authors consider that deformities due to burns should be prevented by proper orthopedic treatment. This subject is one of very great importance but is dealt with very sparsely in textbooks. As a result, medical students receive very little instruction with regard to it.

Deformities due to extensive burns are well known, and, as a rule, a history of numerous and unavailing operations to correct the disabilities and to prevent the contraction of scar tissue is given.

By applying braces or plaster casts commonly used in the treatment of anterior poliomyelitis, peripheral neuritis, etc., the orthopedic surgeon may prevent these contractures.

The authors have used only the simplest forms of splints. In addition, they have made an effort to instruct and interest the interne and nursing staff in the use of their methods. As a result, every patient admitted to the hospital receives immediate treatment and this coöperation has resulted in the prevention of contractures in every case.

The article gives briefly some of the methods of preventing the most common contractures. In burns of the front or the side of the neck, a collar of felt is applied to maintain the head in the midline with the chin directed upward. If there is a tendency toward contracture to one side, the neck is pushed to the other side. The height of the collar corresponds generally to the length of the neck from the chin to the sternum.

Following burns of the shoulder and axilla the arm must be kept in extreme abduction in order to prevent the so-called "bat wing" deformity. In such cases the hand is tied in slight abduction to the head of the bed which is elevated. To avoid constriction of the peripheral circulation, felt is placed around the wrist before the bandage is applied.

In cases of burns at the elbow extension of the arm is maintained by securing the trunk to the opposite edge of the bed by means of a sheet passed around the chest at the level of the nipple, the affected arm being tied to the corresponding side of the bed. Sandbags are extremely useful. In burns of the wrist and finger it is extremely important to keep the adjacent raw surfaces separated.

For burns in the region of the hip, the authors usually tie the feet in abduction to the foot of the bed. A sheet is then placed around the chest and brought to the head of the bed which is placed in

slight Trendelenburg position. This position is of value also in cases of burns of the knee. In burns of the ankle, the knee should be tied to the side of the bed by a sheet passed across it and a sandbag should be placed next to the soles of the feet to maintain flexion.

Recently the authors have been using Thomas splints, ankle splints, and cock-up splints for the knee, ankle, shoulder, and elbow. These have been found extremely satisfactory.

If scar tissue is present gradual stretching is begun. Occasionally it has been necessary to resort to operation under narcosis to stretch the contractions properly. Massage and exercises are begun early, in some instances even when the wounds are still open.

The article cites several specific cases and is very well illustrated.

L. D. PRINCE.

**Estes, W. L., Jr.: The Causes and Occurrence of Functional Scoliosis in College Men.** *J. Am. M. Ass.*, 1920, lxxv, 1411.

Estes' observations are based on the examination of men entering the freshman class at Lehigh University over a period of seven years. Functional scoliosis was found in 1,856 students, 17.2 per cent of the men examined. This percentage was markedly increased during the war period because of the relative increase in the numbers of unfit.

A left curve was observed in 69.8 per cent of the cases; a right curve in 12.6 per cent; and both left and right curves in 17.6 per cent. On the basis of Lovett's classification of scoliosis very few congenital cases were found; those in 1917 constituted only 1.8 per cent of the men examined. Consequently practically all the cases were of the acquired type.

Femoral inequality was responsible for the greatest number of these scolioses (about 42 per cent). This shortening may occur in Bryant's line or in the trochanter-to-external-malleolus measurement and is due usually to mild coxa vara or a variation in the length of the femoral or tibial shaft. Cases classified as occupational constituted 23.6 per cent. Flat-foot was the cause in about 22 per cent of the cases. About 4 per cent were classified as miscellaneous, being due to atrophy and deformity resulting from an old infantile paralysis or asymmetry of the pelvis. Flat-foot is responsible for a considerable number of these cases, but in many other factors also are concerned.

Of 137 cases of short shaft or more acutely angled femoral neck, 107 (78.1 per cent) showed definite obliteration of the scoliosis when support was placed under the foot of the side which seemed short. As a marked preponderance of left-sided scoliosis was noted there must be a great preponderance of short left femurs.

In 30 cases (21.9 per cent) the scoliosis did not disappear when support was placed under the foot but did disappear when the patient lay down. Of these patients, 7 had asymmetrical pelvises and 6 flat-foot.



Flat-foot was found in 20 cases (14.6 per cent); in 7, a left flat-foot with a right short extremity produced a left scoliosis.

In regard to therapeutic measures for those with occupational or flat-foot curves, the author describes exercises designed to correct the scoliosis and strengthen the proper leg muscles. Emphasis is laid on the necessity for daily observance of these instructions. No special classes in the regular gymnasium setting-up drill have been inaugurated. Persons with short extremities are urged to wear a small pad, but few apparently follow this advice for more than a month or two.

In about 20 cases re-examined three years later the curves remained the same. R. S. REICH.

**Legg, A. T.: The Early Orthopedic Treatment of Infantile Paralysis.** *Boston M. & S. J.*, 1920, clxxxiii, 635.

The methods of treatment employed in the recent outbreak of infantile paralysis in Massachusetts are similar to those found successful in the epidemic of 1916. According to the opinion of many, orthopedic treatment should begin at the end of the stage of tenderness, but it is Legg's opinion that it should be begun as soon as the cerebral and febrile symptoms have subsided.

While active therapeutic measures should not be instituted until the sensitive stage has entirely subsided, protective treatment such as the application of a bivalve plaster cast or light wire splints to a sensitive joint in the normal position promotes perfect rest and prevents beginning deformity. During this stage also hot saline baths are very efficacious in the treatment of the sensitiveness. Massage or manipulation would prolong it.

One of the greatest causative factors in deformity is the desire of the parents to get the child up as soon as possible before there is a sign of recovery. The foot hanging in the equinus position favors contraction of the gastrocnemius; the flexed position of the knees favors contraction of the hamstrings; and flexion of the thigh at the hip favors the flexion deformity when there is weakness of the hip extensors. The sitting position also favors deformity of the spine if there is weakness of the trunk muscles.

Such patients should be kept recumbent for two or three months at least, being allowed to sit up only for very short periods for a change in position and then only under careful supervision.

Walking unaided should not be allowed until the muscles have regained sufficient power to perform their function properly. Sitting and walking should be prohibited for two or three months at least, and then allowed only when the patient can be kept in a normal position.

It is of the utmost importance to guard against fatigue from over-use of the muscles. In the 1916 epidemic the patients whose activity had been most restricted showed the greatest improvement.

Before beginning any scientific treatment a careful and thorough examination of the muscles should

be made, their relative strength being recorded as normal, good, fair, poor, trace, or gone. In the cases of infants, in which accurate tests are impossible, the voluntary movements should be watched or the different muscle groups stimulated reflexly. From these charts the exercises for the muscle training should be laid out. The massage and muscle training should be given by a skillful worker either in the hospital or at the home, and the mothers should be instructed so that the child may have daily treatment.

Subsequent complete examinations should be made every three months, and the treatment changed as the case demands. Many problems arise in these cases, the first being deformity caused by contracture of one group of muscles when the opposing group is paralyzed or weakened.

Braces should be applied for two reasons only: (1) to prevent deformity; (2) to allow locomotion.

The chief agents in restoring power to paralyzed and weakened muscles are: (1) massage, to stimulate the circulation in the muscle; (2) muscle training which strengthens an involved muscle by making it perform its exact function.

Muscle training supervised by unskilled assistants may do great harm, for a child will use a strong muscle in performing a movement rather than a weak one, and if muscle training is overdone it may cause fatigue and weakening.

As to the prognosis in muscles completely paralyzed, absolutely nothing can be said. When there is some power, there will be a gain in power under skilled treatment. How much this gain will be it is impossible to say.

R. S. REICH.

**Young, A.: A Case of Ischæmic Contracture of the Forearm Occurring After Fracture of Both Bones of the Left Forearm; Treated by Manipulation and Splinting.** *Glasgow M. J.*, 1920, n. s. xii, 215.

Ischæmic paralysis with or without contracture follows a variety of lesions. It is frequently the result of gunshot injuries of axillary and brachial vessels and less frequently of injuries to the smaller arteries and veins and the larger nerve trunks. In most cases the condition is a complication of fractures of the bones of the forearm or the lower end of the humerus, specially those near the elbow, and is an accident occurring during treatment.

If the patient is not under immediate observation during the early hours or days following a fracture and after the application of splints, the beginning of this complication may escape notice. When the condition is fully established it is characterized by pain, swelling, and discoloration, and later, by pallor. The muscles of the forearm develop a board-like firmness which at first is associated with painful swelling and is followed by a rapid degenerative change in the substance of the muscle fibers, progressing in some cases even to hyaline necrosis.

The further stage in the progress of the Volkmann lesion is a contracture of the fingers upon the palm.



The conductivity of the nerves and the excitability of the muscles may be affected.

Apart from the ordinary forms of treatment, such as massage, passive and active movements, electrical treatment, etc., which may prove beneficial within restricted limits but cannot lead to correction of a definite contracture or lengthening of permanently shortened muscles, the methods used have been chiefly of two kinds: (1) correction of the contracture by cutting down on the flexor tendons at the wrist, splitting and lengthening them individually, and (2) approximating the origins and insertions of the contracted muscles either by resecting portions of the radius and ulna or by displacing the origins

of the contracted muscles to a lower level and implanting them a short distance down the ulna.

In the case reported in this article the four fingers involved were separately stretched under an anæsthetic and fixed in extension in separate moulded splints of sheet tin. The finger splints being secured, palmar flexion of the wrist was maintained by the application of a long, padded metal splint fixed on the extensor aspect of the forearm and hand. This procedure was repeated four times in the following nine weeks, the hand and forearm then being held in a dorsal "cock-up" splint, and electrical and massage treatments were begun. Function was practically restored.

L. C. DONNELLY.

## SURGERY OF THE NERVOUS SYSTEM

**Stopford, J. S. B.: The Results of Secondary Suture of Peripheral Nerves.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Neurol., 67.

The prognosis of secondary suture of peripheral nerves is more favorable the nearer the suture to the spinal cord.

When the injury is in the distal portion of a limb a delay of more than eighteen months before the suture is performed lessens the chances of recovery, but is not of so much consequence when the injury is in the proximal portion of the limb.

Destruction of the branches of a nerve in addition to injury to the trunk may be a cause of incomplete recovery.

Ununited fractures, especially of the humerus, are a serious complication in injuries to the musculo-spiral nerve. Evidence appears to be in favor of primary fixation of the bone.

Imperfect recovery of afferent fibers from such structures as joints, muscles, and tendons is probably an important cause of limited functional recovery of the hand for the performance of purposive actions, although the voluntary power of individual muscles is good.

In regard to the surgical technique of nerve suture

the author states that experimental work has shown that it is advisable to avoid the through-and-through suture whenever practicable.

The construction of a new bed for the nerve after suture is preferable to any autogenous or heterogeneous protective covering. An unsatisfactory bed after suture of the external popliteal nerve in the vicinity of the head of the fibula is probably a cause of many failures.

Displacement of the ulnar nerve in front of the internal condyle of the humerus or its extensive freeing to secure apposition of the ends does not appear to retard recovery.

Liberal resection of the injured ends is essential, particularly if sepsis is prominent.

Perfect recovery after the performance of secondary suture is not to be expected. The chief reasons for the imperfection of the results appear to be:

1. The necessary resection of an appreciable portion of the nerve trunk causes inevitably a disturbance of the intraneural anatomy, however carefully the surgical procedure is carried out.

2. The effort of the nerve to regenerate after secondary suture is a second effort.

H. A. MCKNIGHT.

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

**Murray, J. A.: General Results of Experimental Cancer Research.** *Brit. M. J.*, 1920, ii, 653.

One reason for the present unstable basis of cancer research is the unscientific nomenclature and classification of tumors. The attitude of research workers as well as of the lay and medical press toward reports of a cure is often cynical in that they raise the question as to the actual existence of malignancy. Conclusive evidence is demanded from the standpoint of clinical history, and the opinion of the medical attendants and trained pathologists. This attitude is taken also with regard to reports of the propagation of tumors in experimental animals.

In addition to the clinical criteria of progressive character, local infiltration, metastasis, and recurrence, prior successful transplantation to normal animals should be required. Clement fulfilled these requirements in his experiments with rat sarcoma from X-ray dermatitis and in the production of artificial metastasis by autologous grafting in the primarily affected animals.

The age incidence of cancer may be regarded as due to the relative inefficiency of most forms of irritation in relation to the origin of cancer.

The low percentage of experimental animals in which it is possible to induce cancer still remains unexplained. The short life of these animals is a drawback, and it may be assumed that if sufficiently prolonged irritation were possible the majority of



them would develop cancer. Jensen noted an acquired resistance to grafted cancer following an unsuccessful inoculation, but Haaland and Russell practically destroyed the value of this observation by showing that preliminary treatment had no effect on the autologous grafting of spontaneous carcinoma in mice.

Murray believes that our knowledge of the fundamental processes of all life is not sufficiently advanced for the special purposes of cancer research. The malignant cell differs in some respects from the type of tissue in which it arises. All the differences so far found may be paralleled in the rapidly growing cells of the embryo. Chemical analysis has failed to show any difference in the proteins and the metabolism. Future investigation will be conducted by cultural methods outside the living organism.

Campbell expresses the view that carcinoma is an abortive attempt on the part of the organism to reproduce itself asexually. The best way to reduce the incidence of this disease is to prevent the condition in which its formation is apt to be induced. As the epithelial cells are the least differentiated, they most easily revert to the ancestral type. The conditions favoring this are degeneration due either to an inherited tendency or cessation of function, an abundant supply of nourishment, and local irritation.

Mottram speaks of the variation in virulence of tumor cells and the natural resistance of the organism as shown in animal experimentation. The same is shown in spontaneous cancer and may be racial as well as individual and familial. In certain cases resistance may be increased or decreased by X-ray exposure, the variation depending on the dosage. Lymphocytosis both general and local may be a factor in natural and acquired immunity to cancer.

Russ believes that local immunity is more important. The reason why there is local immunity to some tumors and not to others is not understood. The dual effect of radium and the X-ray which increase and then decrease tissue resistance to cancer will have direct application to the question of the treatment of malignancy with these agents.

Leitsch states that the resistance of the tissues to malignancy is not comparable to immunity to infective diseases and that investigation of the serum of animals immunized to cancer has failed to reveal the presence of antibodies.

Laboratory research on tumors propagated through animals has given information as to methods of diagnosis, chemotherapy, and surgical pathology. Patients will not seek advice before the onset of symptoms and in many cases this is late. Many patients, moreover, are unobservant even after the signs and symptoms are well defined.

Diagnosis of cancer by serum tests based on hæmolysis, complement fixation, etc. has so far failed. The assumption that a cure for cancer may be obtained from chemotherapy is as yet unjustified. The status of radium and the X-ray is also undetermined. Surgery based on sound pathology offers

the best results. Radical operation for cancer of the breast, uterus, and rectum yields a cure on the basis of non-recurrence after five years in about 40 per cent of cases.

Murphy at the Rockefeller Institute showed a definite relationship between lymphocytosis and cancer.

Adami disagreed with Ribbert's theory that cancer is due to a decrease in the restraining influences from without which inhibit the growth of potential cancer cells.

In reply to the discussion of his paper Murray pointed out the fundamental difference between autologous and homologous grafts. MERLE R. HOON.

### BLOOD

Williamson, H. C.: The Use of Blood Transfusion in Obstetrics and Gynecology. *Am. J. Obst. & Gynec.*, 1920, i, 188.

The author's method of matching blood is as follows:

Two white blood pipettes are used. These are rinsed with 10 per cent sodium citrate solution. One is filled with blood from the donor as far as two divisions on the stem of the pipette, then with blood of the recipient to the one (1) mark on the stem, and then with 10 per cent sodium citrate solution to the eleven (11) mark. The other is filled in the same manner, but the proportion of blood of the donor to blood of the recipient is reversed. The pipettes are then incubated at 37 degrees C. for five or ten minutes. A small drop is then placed on a clean slide covered with a cover slip and agglutination is looked for with the low-power microscope. This drop must be small so that there will be no mechanical clumping. If agglutination is present in either pipette, the donor is unsuitable. The first pipette, however, is the most important. The apparatus used is a salvarsan apparatus.

The indications for transfusion in obstetrics and gynecology are:

1. To replace blood lost from uterine or other acute hæmorrhage.
2. To replace blood and stimulate the hæmatopoietic system in secondary anæmia due to repeated small hæmorrhages or toxæmia, or both.
3. To cure hæmorrhagic diseases, especially hæmorrhages of the new-born.
4. Preparatory to operation.
5. In toxæmia of pregnancy.
6. As a prophylactic and curative measure in sepsis.

The author's observations with this method include 18 transfusions given to 17 patients.

Three obstetrical cases were benefited by transfusion; 375 c.cm. of blood were given to one, and 500 c.cm. to each of the others. Hypodermoclysis was used during the operative delivery and supplemented by the transfusion. One patient, who had a rupture of the uterus, died on the fourth day.

Six transfusions were given to 5 patients for secondary anæmia. Four of them had carcinoma of



the uterus with anæmia produced by loss of blood plus the toxæmia of the disease. The fifth case in this group was a case of hæmatemesis during pregnancy. Two of the patients died.

There were two cases of hæmorrhage of the newborn and one of purpura hæmorrhagica in a pregnant woman. Splendid recoveries resulted in all.

In a case of bleeding uterine fibroid the transfusion of 400 c.cm. of blood was followed by a bloody vaginal discharge.

Three patients were given transfusions for toxæmia of pregnancy. One, with a severe toxæmia of the liver type with pronounced dehydration, received 500 c.cm. of blood after an operative delivery and made a rapid, uneventful recovery. The red blood cells increased from 3,288,000 to 3,776,000 following the transfusion, and the hæmoglobin was increased 10 per cent.

Two cases of pernicious vomiting were treated by transfusion. In 1, the transfusion was unsuccessful. In the other, 250 c.cm. were given but in spite of temporary improvement the nausea recurred in a severe form in the course of a few days and it was deemed advisable to empty the uterus.

In 2 cases of sepsis transfusion was unsuccessful.

E. L. CORNELL

#### GENERAL BACTERIAL INFECTIONS

Ashurst, A. P. C.: Report on Tetanus. *Arch. Surg.*, 1920, 1, 407.

In Ashurst's opinion tetanus is a pure toxæmia, and the bacilli or their spores may be present in the tissues indefinitely without causing symptoms unless toxins are formed.

In experimental tetanus in small animals the form known as "tetanus ascendens" occurs. In this condition the symptoms of the disease begin in the inoculated extremity and, though other neighboring parts may become affected subsequently, death or recovery usually occurs before trismus and retraction of the head develop. In larger animals and in man, the symptoms usually begin first in the muscles of the neck and jaws, wherever the point of inoculation, the muscles of the back and trunk being affected later and finally those of the extremities. This form of the disease is known as "tetanus descendens."

It has been demonstrated that the toxin ascends the peripheral nerves to the spinal cord. It also enters the general circulation, but produces characteristic tetanic symptoms only when it reaches the spinal cord, the motor cells of which it stimulates with the result that the muscles controlled by these cells are thrown into tonic spasm. It also renders the sensory side of the cord extremely susceptible to external stimulus.

Certain classes of wounds received in certain types of surroundings are more often followed by the development of tetanus than others. Bacillus tetanus normally infests the intestinal tract of horses and cattle and is deposited with their dung. It is

found also in the intestinal tract of perhaps 5 per cent of mankind.

The growth of the tetanus bacillus is favored by anaerobic conditions of the wound. Contused, lacerated, and gunshot wounds offer ideal conditions for its development.

The care of the wound is the first step in the prophylaxis of tetanus. This includes: (1) mechanical cleansing (débridement, extraction of foreign substances, excision of devitalized tissue), and (2) chemical disinfection. The prophylactic use of antitoxin holds second place to care of the wound.

There are three factors to be considered in connection with the prophylactic use of the antitoxin: (1) the quantity to be administered; (2) the site of the injection; and (3) the frequency with which it should be administered.

The usual prophylactic dose is 1,500 units. The amount of antitoxin required to prevent death increases in geometrical progression with the lapse of time.

Usually the antitoxin is administered subcutaneously. It is better, however, to administer it intramuscularly in the immediate vicinity of the wound in order to flood these tissues with it before the absorption of toxin has begun.

The first injection should be given as soon as possible after the receipt of the wound. When the dose is repeated it should be the same for the later injections as for the first. That tetanus may develop after the prophylactic use of antitoxin cannot be denied, but such cases rarely develop very soon after the injury and when they do, they seem to be less severe than when serum has not been administered.

A distinction should be made between late tetanus (that in which no primary attack occurs before four weeks after the injury), local tetanus (which corresponds to the experimental form known as tetanus ascendens, except that it never becomes general), chronic tetanus (that which is of long duration, irrespective of other factors, is usually relatively mild, and sometimes leaves contractures), and recurrent tetanus (in which a primary attack is followed by others). The incubation period scarcely ever exceeds four weeks.

Accidents due to re-injections of serum are neither frequent nor serious.

The author is of the opinion that until the uselessness of the serum in preventing late tetanus is proved, it is incumbent on surgeons to administer a re-injection of serum at the time of late operations on parts which have been wounded, especially if there is a retained foreign body or a dense cicatrix.

The indications for the treatment of tetanus are: (1) to remove the source which supplies the toxin; (2) to neutralize the toxin already formed; and (3) to depress the functions of the spinal cord.

To neutralize the toxin the best remedy is antitoxin. It is of great importance to inject the maximum quantity of antitoxin indicated as soon as possible. The injections may be subcutaneous, intraneural, intravenous, or intraspinal.



Intraspinal injections should be repeated usually every twenty-four to thirty-six hours unless improvement is noted. The intravenous injection need not be repeated for several days if improvement begins, but if the patient continues to get worse and if the amount injected at first was less than 20,000 units, the same amount should be repeated within from twenty-four to thirty-six hours.

The technique of intraspinal injection consists briefly in removing 5 to 10 c.cm. of spinal fluid under an anæsthetic (the author prefers chloroform) and injecting the undiluted antitoxin slowly. For intravenous injections it is customary to dilute the serum with saline solution up to a total quantity of about 500 c.cm. The author is convinced that the injection of the undiluted serum intravenously is injudicious because of the likelihood of producing thrombosis or embolism.

The third indication in the treatment is to depress the function of the spinal cord. This is done by the administration of chloral, chlorbutanol, the bromides, magnesium sulphate, or sodium persulphate. Ordinary doses are not sufficient but death may result from an overdose.

Ashurst emphasizes the fact that the patient as well as the disease must be treated.

The article is concluded with the history of one of the author's cases in which his method of treatment is illustrated.

G. W. HOCHREIN.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Cope, V. Z.: The Clinical Significance of Shoulder Pain in Lesions of the Upper Abdomen.**  
*Med. Press, 1920, n. s. CX, 410.*

From the consideration of a few clinical cases recently under his care the author arrives at the following conclusions:

1. The cause of pain in the shoulder in abdominal lesions is irritation of the diaphragm rather than of the abdominal viscera.

2. Unilateral irritation of the diaphragm causes pain over the corresponding shoulder.

3. Acute bilateral shoulder pain indicates median irritation of the diaphragm and is commonly due to a perforated gastric ulcer.

4. There is a correspondence between the distribution of the descending cervical cutaneous branches of the third and fourth nerves and that of the phrenic nerve on the same side. The pain caused by irritation of the front of the diaphragm is referred to the clavicular or subclavicular region; irritation of the dome, to an acromioclavicular or acromial region; and irritation of the posterior portion, to the supraspinous fossa.

5. Pain on top of the shoulder is apt to be of diagnostic value in subphrenic abscess, diaphragmatic pleurisy, actinomycosis of the chest, and liver abscess, and possibly in some cases of acute pancreatitis.

De Quervain and Sherren have stated that pain is sometimes felt in the left shoulder in cases of

perforated gastric ulcer, but the author has been unable to find in the literature any mention of bilateral shoulder pain or pain in the right shoulder in this condition.

Pain on top of the shoulder was rare in the author's cases of gall-stone disease, and when it was present could always be explained by some direct irritation of the diaphragm.

E. C. ROBITSHEK.

**Phemister, D. B.: The Recognition of Dead Bone Based on Pathologic and X-Ray Studies.** *Ann. Surg., 1920, lxxii, 466.*

When bone dies rapidly and in appreciable quantity due to infection in osteomyelitis, compound fractures, tuberculosis, and, rarely, in lues, it is at first indistinguishable either by its gross or its roentgenologic appearance from the adjacent living portions.

Granulation tissue soon attacks dead bone, but its activity becomes most marked after the acute inflammatory stage subsides. Reduction in volume of the dead portion occurs from lacunar absorption by the granulations along its surfaces. Because of the unequal action of these granulations there may be marked variations in the outline of a sequestrum. The rate of destruction is greater while the dead bone is still attached to, or incarcerated by, living bone. Dead cancellous bone is destroyed more rapidly than cortex in which the first changes shown in the X-ray usually occur.

Changes in the living bone consist of local absorption and regional atrophy and transformation of pre-existing bone, and new bone formation.

Secondary bone necrosis usually occurs in atrophied old bone, spongy new bone, or a combination of the two. As the infection is limited, the formation of large sequestra is unusual.

Dead bone is distinguished from living bone by its density, demarcation, and contour. These are best determined from a practical standpoint by means of the X-rays.

In the X-ray picture it is seen that the density of dead bone is greater than that of an equal volume of surrounding living bone and the original compact texture is retained. Living old bone has its density evenly reduced by atrophy and is occasionally streaked from dilated longitudinal cannular markings. Newly formed bone is spongy in texture and of low density.

There are numerous variations from these general statements. When dead bone is extensively eroded its shadow density is reduced so that it may be equal to or below that of the living bone. It may be distinguished from the latter, however, by its blotchy uneven character. Secondary sequestra usually show no variation in density from the adjacent living bone. The line of demarcation between dead and living portions is usually sufficiently wide and clean-cut to be of great value in the diagnosis, but any oblique or tortuous portions, especially



when overlapped by heavy living bone, may be indistinguishable or very indistinct. Notches or unevenly streaked or dotted lines may indicate incomplete separation of the dead portion.

The outline of the sequestrum is of great diagnostic value. When it is unattached its surface is smooth, sharp, and straight, but when erosion has occurred it is irregular. Sharp spicules, especially about the ends, are frequently noted. Preservation of the smooth curved cortical rim in sequestra bordering on an articular surface and of clean-cut fracture lines late in infected fractures are points of value. The compact texture of dead bone gives its outlines a sharpness that the less dense and frequently growing living surfaces do not possess. Evidence of irregular destruction of spongy bone at the ends of the shaft in osteomyelitis is indirectly a fairly definite sign that dead portions are present even though their outlines cannot be made out.

There are many difficulties in distinguishing dead bone in the X-ray, the greatest of which is due to overlapping of shadows of necrotic and living portions by which the details of each are obscured. This can usually be obviated by obtaining views from different angles.

The density of a transplant is greater than the adjacent atrophied fragments between the fourth and tenth weeks. After this time the density of the transplant gradually approaches that of the fragments.

The article contains 17 plates. C. R. STEINKE.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Topley, W. W. C.:** Some Experiments Bearing on the Local Formation of Antibodies. *Proc. Roy. Soc. Med., Lond.*, 1920, xiii, Sect. Path., 144.

The experiments briefly reported in this paper were undertaken to determine whether any evidence could be obtained of the local formation of antibodies or possibly of intermediary substances at the site of inoculation of a relatively large dose of a suspension of killed bacteria.

The method adopted was the preparation of an extract of the connective tissue, mainly muscle, into which the suspension had been previously injected, and its examination as regards: (1) its power of inducing phagocytosis of the homologous bacteria, and (2) its influence (if any) on the phagocytosis of the same bacteria in the presence of normal or immune serum. A similar tissue extract from a part remote from the site of inoculation was examined as a control.

The animals employed were rabbits. The bacterial suspension was prepared from a strain of the staphylococcus aureus, the same strain being used both for the inoculations and for the phagocytic experiments. The injections were made into the thigh muscles of the left leg. In most cases the dose given contained 1,000,000,000 killed cocci per kilo of body weight but in a few it contained ten times

this number. In certain experiments a second inoculation was made in the same site after a varying number of days. In every case a control inoculation with the same volume of saline solution was made into the thigh muscles of the right leg.

All the extracts studied had the power of binding complement. On the other hand the routine control test with an extract prepared from a similar tissue remote from the site of inoculation and several control experiments carried out with similar extracts prepared from normal rabbits showed no evidence of any influence on the degree of phagocytosis induced by normal or immune serum. Titration of the extracts as regards their anti-complementary power showed in almost every case that this power was abolished by diluting them ten times with normal saline solution.

The whole series of experiments gave uniformly negative results. The extracts themselves never induced more than a minimal degree of phagocytosis and neither increased nor decreased the degree of phagocytosis occurring in the presence of normal or immune serum. The extracts from the tissues at the site of inoculation of the bacterial suspension differed in no demonstrable way from those prepared from other tissue in other portions of the body of the same animal nor from similar extracts prepared from normal animals.

In conclusion the author states that, with the exception of von Dungern's experiment and possibly that of Romer, there is, therefore, no striking evidence of the production of antibodies by the tissues at the site of inoculation and these solitary and uncorroborated results can hardly stand against the far greater weight of negative evidence.

G. E. BEILBY.

**Brown, W. H., and Pearce, L.:** Syphilitic Affections of the Mucous Membranes and Mucocutaneous Borders. *J. Exper. M.*, 1920, xxxii, 497.

A study of cutaneous syphilis in the rabbit brought out the fact that although the infecting organisms might be widely distributed through the body, lesions of an easily recognizable character occurred almost exclusively within certain restricted areas, the remainder of the skin surface rarely showing any manifestation of disease. It was found also that lesions developed with considerable frequency in parts of the body where skin and mucous surfaces join. In some instances they first appeared within the skin area, while in others they developed upon the mucous membrane. Accordingly most of them were classified as affections of one or the other of these structures. It appeared, however, that the transitional area exercised some influence upon the localization of the infection, and since lesions which developed in one tissue usually extended to the other, their classification as affections of mucocutaneous borders seems to be more logical.

Among the animals first studied by the authors localized infections of the mucous membranes and mucocutaneous borders were noted in about 20



per cent but were less frequent among those studied more recently. The affections seen in these animals were of two general classes, depending upon the type of the lesions present. In one group the lesions were characterized by diffuse infiltration, surface erosion or ulceration, and the formation of exudates of various types; in the other, there was a greater degree of proliferation and the lesions consisted of large granulomatous masses which showed the usual secondary transformations of syphilitic processes. Affections of these two classes were distributed about the nares, the lips, the margins of the lids, the genitalia, and the anus.

The authors append to their article a series of 31 plates showing the various conditions, and summarize their findings as follows:

In a series of more than 200 rabbits in which generalized lesions were observed following local inoculation with *treponema pallidum* there were a number of animals in which characteristic lesions were noted upon mucous membranes or along mucocutaneous borders. These lesions were distributed with about equal frequency between the nose or nasolachrymal system and the eyelids on the one hand, and the genital and anal regions on the other. The lips and buccal mucosa appeared to be less subject to localized infections unless the papillomatous growths noted on the lips and the underside of the tongue proved in some way to be connected with such an infection.

In many instances the local reaction was initiated by an acute inflammatory process, and in nasal and genital infections a definite exudate was formed. The succeeding stages of the reaction consisted in an infiltration of the parts involved, together with a variable degree of proliferation of fixed tissue cells, which led eventually to necrosis and ulceration. The resulting lesions differed according to their location and the character of the reaction in the individual case. Localized infections of the nose occurred in several forms, first, as a rather diffuse affection of the nasal mucosa characterized by the presence of a mucopurulent exudate; second, as a more or less circumscribed process of infiltration with a special predilection for the region of the anterior nares; and third, as a granulomatous process involving the alæ in particular.

Involvement of the nasal mucosa was very commonly associated with lachrymal overflow and some degree of conjunctivitis.

The lesions of the eyelids were usually small, elevated papules or lesions of an ulcerative character, some of which were surrounded by a zone of infiltration. In exceptional instances large granulomatous lesions occurred along the margins of the lower lids.

Infection of the penis and sheath gave rise to conditions analogous to those of the nose. In one group of animals there was a diffuse affection characterized by redness and swelling of the parts with a mucopurulent exudate; in another, circumscribed or diffuse infiltrations; and in a third, indurated

granulomatous masses. Secondary necrosis with erosion or ulceration was a common feature of all these conditions.

Localized infections in the region of the anus differed from those in other localities chiefly in the absence of an exudative group of affections and in the frequency of lesions of a papillomatous type.

Lesions of mucous membranes and mucocutaneous borders developed at periods of time varying from a few weeks to several months after inoculation. Most of them were rather enduring and in several instances persisted in an active state for considerably more than a year.

G. E. BEILBY.

**Plant, O. H.: The Effect of Carminative Volatile Oils on the Muscular Movements of the Intestine.** *J. Pharmacol. & Exper. Therap.*, 1920, xvi, 311.

When applied to the mucous membrane of unanesthetized dogs carminative volatile oils in dilute solution increase the muscular movements of the intestines. This increased activity involves an augmentation of tone and rhythmic contractions, and, at least during the increase in tone, progressive contraction rings of peristalsis occur.

Occasionally the primary increase in muscular activity is followed by a decrease in tone and in the amplitude of the rhythmic contractions.

These effects are lessened, but not abolished, by atropine. They are abolished when the sensory endings of the mucosa are paralyzed by cocaine.

After the muscular activity of the intestines of dogs has been markedly increased by the injection of small doses of morphine, the same effect is produced by the volatile oils as before the injection of the morphine.

SAMUEL KAHN.

**Pinardi, G.: The Treatment of Diffuse Peritonitis Experimentally and Clinically** (Il trattamento delle peritoniti diffuse nell' esperimento e nella clinica). *Arch. ital. di chir.*, 1920, ii, 245.

The author performed a number of experiments on animals to determine: (1) the behavior of the normal peritoneum in the presence of the more commonly used physiochemical therapeutic agents; (2) the similarity between the evolution of an acute infective and a provoked tuberculous peritonitis cured experimentally by different methods; (3) the relationship between clinical and experimental findings.

According to these experiments the best results in experimental purulent peritonitis are obtained from simple drainage of the abdominal cavity and from drainage combined with the use of ether and camphorated oil. Ether has one disadvantage in that it is absorbed too rapidly.

The author found it extremely difficult to produce tuberculous peritonitis in animals resembling that seen in clinical cases by intraperitoneal injections of the Koch bacillus. Better results were obtained from injections of tuberculous sputum. Neither from necropsies nor otherwise was Pinardi able



to determine that injections of various drugs had any definite curative effect.

While the clinical cases studied were too few in number to warrant definite conclusions, the author is of the opinion that the use of 2 per cent iodoformized ether is to be recommended in cases of tuberculous peritonitis, especially when there is much effusion. Ether produces an acute reactive aseptic peritonitis and an exudation of fluid. This explains its action on the tubercle bacillus which leads to hydropic degeneration of the tuberculous process. The iodoform, which slowly decomposes into iodine, also helps in the destruction of the bacillus and modifies the toxic contents in the serous fluid.

In diffuse purulent peritonitis treatment with drugs must yield to surgical treatment, but should not be discarded entirely as it is a necessary adjunct when the intestine, stomach, or heart is affected.

W. A. BRENNAN.

#### ROENTGENOLOGY AND RADIUM THERAPY

Macleod, N.: **Fourth Note on the Radiography of the Gall-Bladder.** *Arch. Radiol. & Electrotherapy*, 1920, XXV, 181.

This note is devoted largely to the differential diagnosis of gall-stones. A shadow in the right upper quadrant resembling a bunch of grapes may be interpreted definitely as gall-stones. Those which are ring-like, honeycomb-like, or of a mottled appearance are also probably due to this cause. All others are doubtful and every effort should be made to ascertain their depth in comparison to fixed parts such as the spine or the anterior abdominal wall as indicated by the ribs or artificial marks on the skin. This relation can be ascertained most easily by stereoroentgenograms with plates behind or in front.

Renal stones are the most apt to require differentiation and the method described is best suited to determine their presence. As regards the technique of making lateral roentgenograms advocated by Knox, the author states that in his opinion it is not feasible nor practicable in most cases. Neither does he believe the method of making pyelograms advocated by Braasch is infallible inasmuch as overlying shadows may be obscured.

Numerous shadows scattered over a considerable area and varying in position are probably due to concretions in the mesenteric glands.

Ossification of rib cartilages presents little difficulty if a stereogram is made.

Faecal and pancreatic concretions have not been observed by the author or not distinguished by him.

Gall-bladder adhesions and other abnormalities giving rise to suspicious shadows which may have relation to the stomach, duodenum, or colon and make an opaque meal necessary.

In conclusion the author states that, whenever possible, suspected gall-bladder cases should be examined roentgenographically by stereoscopic plates. Except when the shadow is characteristic and the roentgenographer is able to state fairly definitely that gall-stones are present, it is wise to

state merely that the body causing the shadow is at normal kidney depth, in front of that region, not so deep as the body of the lumbar vertebra opposite, close to or just behind the rib cartilages in front, or in the normal gall-bladder region. If the shadow is not dense, thickening of the gall-bladder wall should be mentioned as a possible condition, the localization being made from a stereogram with the plates behind or in front. Failing such estimation with a stereogram, the displacement of the outer edge of the shadow compared with that of the right edge of the vertebra opposite determined by compass measurements on the two halves of the stereogram plates (not prints) will indicate which displacement is greater.

ADOLPH HARTUNG.

Baetjer, F. H., and Friedenwald, J.: **Roentgenological Aspects of Lower Right Quadrant Lesions.** *Am. J. M. Sc.*, 1920, CLX, 639.

The roentgen examination of the right lower quadrant is of importance in the direct as well as the differential diagnosis of such conditions as: (1) appendicitis, (2) incompetent ileocecal valve and ileal stasis, (3) dilatation of the cæcum with retention, (4) adhesions and angulations, (5) ulcerations due to tuberculosis, and (6) ulcerations due to carcinoma. Both bismuth meals and enemata must be employed, the information obtained from the one supplementing that from the other.

In acute appendicitis the roentgen examination may be of value in certain instances, especially to differentiate the condition from other acute lesions in the right lower quadrant. It may even show the presence of some pathologic condition such as a beginning pneumonia in the lower right lobe, the symptoms of which simulate those of acute appendicitis. In chronic appendicitis it may render valuable service when the lumen of the appendix is patent.

The fluoroscopic examination combined with palpation is especially valuable. Tenderness immediately over a fixed visualized appendix, kinking of which remains constant, and persistent pointing upward of the appendix toward the gall-bladder region are fairly diagnostic of a pathologic condition. Retention of parts of the meal in the appendix for more than a day or two indicates poor drainage. A condition frequently found associated with chronic appendicitis is dextroposition of the pyloric end of the stomach. This may or may not be associated with adhesions to the omentum. Adhesions secondary to a pathologic appendix may lead to varying degrees of cæcal or ileal stasis and even to partial colonic obstruction. In certain cases the roentgen examination does not give positive information and may even be misleading. Thus the appendix may not be visualized at the time of the examinations because of an obliterative condition or because it is in an unusual location. In other cases tenderness may be absent between the attacks. Other associated conditions, such as secondary deformities of the duodenal cap, may be mistaken for the primary lesion.



Incompetence of the ileocaecal valve and ileal stasis are usually indicated by the fact that at the end of twenty-four hours after a bismuth meal the ileum is entirely empty and at the end of from thirty-six to forty-eight hours the terminal ileum is filled, indicating the presence of regurgitation from the caecum to the ileum. They are indicated also by the entry of the opaque enema into the ileum, but care must be used in drawing this conclusion as forced pressure may be responsible. Ileal stasis may be occasioned by spasm, ileocaecal valve incompetency, bands of adhesions, displacements, prolapse, or tumors; dilatation of the terminal part of the ileum usually points to obstruction.

Dilatation of the caecum with retention is readily ascertained by the roentgen examination. In some instances it may be associated with chronic appendicitis, and both may be due to high degrees of enteroptosis due to a secondary low-grade inflammatory process. Dilatation of the caecum may be present even when the patient does not complain of constipation but, on the contrary, states that the bowels move regularly every day.

Adhesions and angulations are usually recognized readily with the aid of the roentgen ray. These conditions may be associated with marked fixation and may result in various degrees of obstruction. They may be secondary to disease of the appendix, dilatation of the caecum with retention, or inflammatory pelvic conditions.

Tuberculous ulcerations present hypermotility and spasm of the bowel, especially of the caecum and ascending colon, in the X-ray picture. There is also irregularity of outline showing definite filling defects at the site of the lesions. When these findings are associated with pulmonary tuberculosis they constitute very definite evidence of tuberculosis of the colon.

In ulceration due to carcinoma there is a definite filling defect in the caecum. This is large, serrated, and constant, and associated with tenderness to pressure and fixation. A variable amount of obstruction may be present. The findings should be confirmed preferably by repeated examinations made at intervals of several days. The use of the opaque enema is the best method of examining colonic growths.

In conclusion the authors state that in the diagnosis of lesions of the lower right quadrant the roentgen-ray examination, though extremely valuable, is merely one of many methods by which conclusions may be drawn. Like all diagnostic procedures it may lead to a wrong conclusion if the findings are interpreted incorrectly. As in cases of other lesions, those in the lower right quadrant of the abdomen should be studied in conjunction with the clinical signs. If the roentgen-ray interpretation is diametrically opposed to all the clinical findings and the two methods cannot be harmonized it is best to adhere to the clinical interpretation. No one method of diagnosis must be looked upon as absolute.

ADOLPH HARTUNG.

**Braasch, W. F.: Roentgen Examination of the Urinary Tract Made Opaque.** *Am. J. Roentgenol.*, 1920, vii, 584.

Pyelography was first described by Voelcker and von Lichtenberg in 1906, but was not widely used until it was more completely developed in America several years later. The author suggests the term "urography" to denote the outlining of the whole urinary tract by opaque media and the roentgenogram. This procedure is not without danger to the patient unless it is used by those skilled in urology and roentgenology. It is contra-indicated in the cases of patients who are in advanced age or greatly emaciated, cases of advanced bilateral renal disease, and those in which no benefit will be received from treatment.

In the early work in pyelography collargol was used as a medium. This was followed first by the use of thorium as suggested by Burns, later by iodides as suggested by Cameron, and by bromides as advocated by Weld. Iodides and bromides are most generally used at the present time, and although they are comparatively harmless they must be employed with care. The medium should be introduced by gravity and should be removed as completely as possible from the kidney pelvis after the X-ray exposure. Usually 5 c.cm. or at most 10 c.cm. will be found sufficient.

The diagnosis of hydronephrosis can usually be made without a pyelogram by withdrawing the fluid from the kidney pelvis. The interpretation of a pyelogram in these cases may be difficult because of impassable obstruction at the ureteropelvic juncture or dilution of the medium by retained fluid or because the amount injected is insufficient to fill the pelvis completely.

Pyelography is recognized as a frequent and valuable aid in the diagnosis of renal neoplasm. The pyelograms in these cases often resemble those obtained in polycystic kidneys, although usually retraction and narrowing of the calices are noted. A polycystic kidney frequently has an abbreviation of one or more calices and seldom any narrowing. Pyelograms are contra-indicated when a diagnosis of polycystic kidney is apparent on clinical examination as infection may follow retention of the medium in an obstructed calix. Hydronephrosis with deformity, such as is usually seen in cases of neoplasms, suggests epithelioma of the pelvis.

The chief value of the pyelogram in nephrolithiasis lies in the identification of the shadow which otherwise might be confused with extrarenal shadows. Since fluoroscopy has been employed at operation the use of the pyelogram as a means of localizing the shadow is not so important as formerly.

Urography often demonstrates anomaly or malposition, but is not without risk of serious complications if there is only one kidney.

Cystography is of great assistance in the diagnosis of tumors of the bladder when hæmorrhage precludes satisfactory cystoscopy. Bladder diverticula may be overlooked in cystoscopic examination and re-



vealed only by a cystogram. The presence of an enlarged prostate may be indicated by a filling defect in the bladder outline at the ureteral opening.

The cysto-ureterogram may be of value if there is marked inflammatory dilatation of the renal pelvis and ureter. It is not without danger, however, if the medium enters both renal pelves and cannot be drained readily.

G. S. FOULDS.

**Bingham, G. H., and Richards, G. E.: Co-Relation of Results of Treatment by Surgical and X-Ray Methods.** *Canadian M. Ass. J.*, 1920, x, 988.

This paper is based upon the results obtained in 300 cases of thyroid gland disease treated with the roentgen ray or surgery, or both combined. In view of the known facts regarding the structure of the gland and the changes it undergoes in disease, it is logical to expect a modification of its function on treatment with a therapeutic agent such as the roentgen ray which has a selective action on certain types of cells.

Taking up the various types of goiter treated, the authors state that the results obtained by roentgen therapy in simple colloid goiter were quite uniformly successful, 90 per cent being completely cured. The other 10 per cent included several which were probably classified incorrectly. In most of the cases in which this treatment failed the symptoms disappeared, but the swelling of the gland was not materially affected. A certain number, probably about 2 per cent of the total, however, became surgical. The authors therefore conclude that radiotherapy should be given a fair trial before surgery is considered. Adenomatous goiters, with which are grouped all cystic types not complicated by toxic symptoms, do not respond to roentgen therapy and are entirely surgical. Toxic goiters, which include the hyperplastic types and degenerating adenomata or mixed types, showed marked improvement in a large majority of the cases. Some inoperable cases were rendered safe operable risks and very few failed to show at least some improvement.

Of 300 cases treated, 228 (76 per cent) showed some improvement; 16 (5.3 per cent) failed to improve; and 56 could not be accurately classified for various reasons. Of the patients who were benefited, 158 (50.3 per cent) were relieved of all symptoms; 26 were benefited to such an extent that operation was possible and relatively safe; and 44 were relieved of the majority of symptoms, but were not operated upon. No figures are available to show the frequency of recurrence in the cases treated solely by the roentgen ray, but included in the second group were 10 cases previously operated upon in which a recurrence had developed.

Improvement manifests itself by the disappearance of nervousness, irritability, tremor, and tachycardia, an increase in weight, and a variable reduction in the size of the goiter and the exophthalmos.

In conclusion the authors state that roentgen therapy is logical and scientifically sound for certain

types of goiter. It is not a question of radiotherapy versus surgery but of the best interests of the patient which frequently make a thorough preliminary trial of roentgen therapy advisable. The article is summarized as follows:

1. The roentgen ray is capable of definitely modifying the function of the diseased thyroid gland in a favorable manner.

2. The cases of goiter best suited for this treatment are the toxic types, and of these the early cases are more favorable than those which are older and more chronic.

3. Improvement may be expected in about 80 per cent of all cases and complete cure in 50 per cent.

4. The length of time required for each case will average between six and eight weeks.

5. Cases which are not definitely cured, but are improved are made much safer surgical risks.

6. Adenomatous goiters do not respond well, and if no toxic symptoms are present the method is not to be recommended.

7. Cystic types without toxicity do not respond at all and, with uncomplicated adenomata, are purely surgical.

8. The advantages of the method are the ease with which it may be carried out, its safety to life, its painless nature, and its freedom from shock. Its disadvantages are the time consumed and the possibility of consequent fibrosis of the capsule.

ADOLPH HARTUNG.

**Finzi, N. S.: The Treatment of Tumors by Radium and the X-Rays.** *Brit. J. Surg.*, 1920, viii, 68.

The amount of radiation necessary to destroy tissue varies for different types of cells; many malignant cells are destroyed by only a small fraction of that which destroys healthy tissue.

A particular type of cell in any part of the body generally gives the same response to either radium or the X-ray. Glandular tissue is more sensitive than epithelium and epithelium responds more quickly than muscle. Growths also vary in their sensitiveness; the rate of response of a tumor depends on its type, situation, and stage of development.

In radiating malignant tumors the aim is to destroy the growth without injuring the surrounding tissue. Destruction of the healthy tissue prevents repair, causes pain, leads to sepsis and absorption of toxic material, and forms an impermeable barrier to future radiation. It has been proved by animal experimentation that malignant cells lose their metastatic power when subjected to radiation. For this reason prophylactic exposures are desirable in that they prevent tumor implantation into healthy tissues during operative procedures.

In some cases an insufficient dose applied to an obstinate tumor may stimulate its growth. Excessive radiation generally does no harm and at times the treatment of an exposed area will have a beneficial effect on more distant foci. Pain is usually eased by radiation, although it may be aggravated by large doses. Radium is of value also in keeping a



malignant stricture open, especially in the œsophagus or rectum and is very efficient in arresting hæmorrhage from tumors. At times its hæmostatic action alone justifies its use.

Inoperable tumors are occasionally rendered operable by a series of radiations. The rapidity of reaction and the diminution in the size of the growth determine the efficiency of the local application.

Certain tumors are treated more effectively with radium than with surgery. Radium treatment is successful in about 98 per cent of rodent ulcers. Lymphosarcoma yields very readily to radiations and should never be treated surgically except for the insertion of the radium into the tumor. Endothelioma of the parotid and palate responds very well to radium and X-ray treatment. In some clinics carcinoma of the cervix is treated solely with radium. In the later stages carcinomatous cells are only moderately susceptible to radiation.

A number of tumors are so situated that radiation alone is not satisfactory, but very good results may be brought about by prophylactic exposure followed later by surgery. Epithelioma of the cheek and the floor of the mouth and carcinoma of the breast and rectum may be included in this group.

A few growths, such as epithelioma of the tongue and vulva, are excited to increased activity by radiation. Pain and hæmorrhage, however, sometimes necessitate radiation of these tumors in spite of the possibility of extension. The more penetrating the rays, the better the ultimate results. The author states that, in equal strength, the gamma rays of radium are superior to X-rays. All malignant growths are more susceptible to radium than to the X-rays. In some cases the type of rays to be used is determined by the location and accessibility of the tumor. Radiations should be continued for some time after all clinical signs of the disease have disappeared. In treating malignant areas it is important to focus on the surrounding lymphatics and local glands. A combination of radium treatment at the growth and exposure of the lymphatics to the X-ray is sometimes desirable.

If the malignant area reacts readily to radiation, sepsis clears up rapidly, but if the tumor is refractory the sepsis often becomes worse. The author has found that the administration of 1 gm. of calcium glycerophosphate three times a day, begun the day before and continued the day after treatment is often effective in preventing or alleviating the sickness which follows radiation.

There are two main varieties of radiation burns. The acute type develops like an erysipelas, with redness, pain, and swelling. The parts should be kept quiet and protected. Bismuth carbonate or zinc oxide may be applied locally; antiseptics should not be used. The second or chronic type of burn begins as a small localized ulcer with an indolent surface and a bright red border.

Angiomata and lymphangiomata are favorably influenced by radiation; keloids respond readily but require a greater exposure. Good results have been

obtained by treating fibromyoma of the uterus with radium. Particular care must be taken when the patient is under 38 years of age, as atrophy of the genitalia with kraurosis vulva may occur in young people treated by radiation. Exophthalmic and parenchymatous goiters have also been successfully treated with radium and the X-ray. The author emphasizes the fact that with radiotherapy at hand "inoperable" no longer means "incurable."

A. J. SCHOLL, JR.

**Levin, I.: The Rationale of Radium Therapy in Cancer.** *Am. J. Roentgenol.*, 1920, vii, 552.

The terms "selective action" and "selective absorption" which are used rather promiscuously in reality imply two different phenomena in the interaction between the X-rays and radium and the cells. Thus the term "selective action" means that the identical rays act differently on different tissues. The lymphocytes of lymphatic leukæmia and those of conditions of inflammatory leucocytosis are morphologically identical. Radium nevertheless destroys the former rapidly and has but little effect on the latter. Levin cites also other instances of "selection action" and gives evidence in the form of an experiment performed with the X-rays upon the lymphocytes of turtles.

In regard to "selective absorption" the author states that the same tissue may destroy or "absorb" one type of rays and not another. When two turtles were superimposed and then rayed a very considerable difference was noted in the lymphocyte count of the lower turtle whether the upper one was alive or dead. Living cells have the power, which is not possessed by dead cells, to absorb or destroy certain rays.

The fact that radium may destroy a malignant tumor without injuring the adjacent normal tissues is a true indication that radium does not act as a caustic but has a specific "selective action" on the tumor. Cancer tissue submitted to radiation shows on examination marked degenerative changes in the tumor cells, consisting of vacuolation of the protoplasm, pycnosis of the nuclei, karyolysis, and the ultimate complete necrosis of the cell. The cellular changes are accompanied by a round-cell infiltration which is subsequently changed into dense sclerotic connective tissue poor in blood vessels. The new connective tissue formation ultimately dominates the picture to such an extent that some observers maintain it is the only direct effect of radiation, the destruction of the tumor cells being secondary and due to lack of nutrition. To show that the rays have a direct effect upon tumor cells the author with Levine undertook to study the influence of the X-rays on the crown gall. This disease is a new growth which develops spontaneously or may be induced artificially in various plants. Since plants possess no lymphoid tissue, no connective tissue can form and the behavior of the tumor cells is unobstructed. The results showed that the rays arrested the development of the tumor.



It is the author's opinion that the first effect of the rays is on the tumor directly and consists of the inhibition of the proliferating power or the sterilization of the cells. The degeneration and destruction of the cancer cells and the formation of sclerotic connective tissue take place subsequently.

A normal parenchymatous cell has a life cycle of youth, maturity, and senility which terminates usually with the death of the organism. The life of an individual cancer cell is short, the changes taking place very rapidly. In the malignant variety the cell divides just before senility into two young daughter cells. When the rays arrest this proliferation the cancer cells degenerate.

The round-cell infiltration which surrounds the groups of radiated cells and which is later changed into dense sclerotic connective tissue is of secondary occurrence, but of greater practical importance than the destruction of the cancer cells themselves. After the most perfect radiation viable though stunted cells may remain, which, if not held in check by the dense connective tissue wall, might later cause trouble.

In a pathologic study of skeletal metastases of carcinoma the author found that the metastasis usually begins in the marrow and as the tumor nodule increases in size it approaches and invades the compact osseous tissue. The cancer cells themselves act as osteoclasts and destroy the bone while the healing power of the organism attempts to form new bone.

Levin believes that the method now being employed by some in which one intense dose of radium or X-rays is given and not followed by a further application for a long time is erroneous and must lead to ultimate failure for the reason that the first action of the rays consists in the inhibition of the proliferating power of the nucleus. As a result the cancer cell does not divide but enters a state of maturity in which it may remain as resistant to the action of the rays as a normal tissue cell but still always potentially a cancer cell with the possibility of sooner or later recovering its proliferating power and creating a new tumor mass unless repeatedly radiated.

W. L. BROWN.

#### LEGAL MEDICINE

**The Right to Practice a Valuable Property Right—Powers of Board of Medical Examiners to Suspend Licenses.** *Luckow vs. Board of Medical Examiners, California Supreme Court, 187 Pac., p. 965.*

The right to practice medicine, like the right to practice any other profession, is a valuable property right which is protected by the Constitution and laws. The Fourteenth Amendment to the Constitution of the United States provides that no person shall be deprived of life, liberty, or property without due process of law. Therefore no one can be deprived thereof without notice and a hearing before some tribunal authorized to determine the question.

J. A. CASTAGNINO.

**Industrial Board Has No Jurisdiction to Determine Physicians' Fees under Contract.** *National Car Coupler Co. vs. Sullivan, Indiana Appellate Court, 126 N. E., p. 494.*

Under the Workmen's Compensation Act of Indiana the Industrial Board has no power to pass upon the fees of a physician employed by an employer. However, if a physician is called in an emergency to treat an employee because of failure on the part of the employer to provide medical care, or for other good reason, the fees of the physician become subject to approval by the Industrial Board unless the employer employs the physician.

J. A. CASTAGNINO.

**May Sue Insurers—Proper Charges of Surgeon.** *Home Life & Accident Co. vs. Cobb (Texas), 220 S. W. R., p. 131.*

The court held that under the Workmen's Compensation Law of Texas physicians may sue the insurers of employers for medical services rendered injured employees. In this case the physician was called to administer surgical and medical treatment to the employee (who was insured by the plaintiff), either at the request of the employer or with his knowledge.

The amount of the physician's bill was \$150. The law makes the insurer liable for the medical bill for the first two weeks only. In this case the treatment was entirely of a surgical nature and after the first two weeks was of incidental character. In cases of this kind physicians usually charge not by the visit or treatment, but for the case. Under the circumstances the charge was held to be proper.

J. A. CASTAGNINO.

**Liability for What Is Done To Disease—Duty to Avoid Injuring the Weak.** *Hanson vs. Dickinson (Iowa), 176 N. W. R., p. 823.*

The court held in this case that although a bruise sustained by an employee in the course of his employment was slight and would not have resulted in prolonged disability but for latent gonorrhoea, the claimant is entitled to compensation if there is evidence that hidden gonorrhoeal trouble can be lighted up by a bruise.

J. A. CASTAGNINO.

**Sued for Exhibiting Motion Picture of Operation.** *Feeney vs. Young (N. Y.), 181 N. Y. Supp., p. 481.*

The plaintiff in this case had been subjected to a caesarean section. She consented, though not in writing, to have a moving picture taken of the operation to be exhibited before medical societies and in the interests of medical science. Thereafter the picture was exhibited in two leading moving picture houses in New York as a part of a picture entitled "Birth." The exhibition was made for the purposes of trade.

On account of the fact that the trial court refused testimony as to the exhibition of the picture, the Appellate Court reversed the case for a new trial.

J. A. CASTAGNINO.



**No Action for Anguish for Death on Operating Table.** *Croom et ux. vs. Murphy (N. C.)*, 102 S. E. R., p. 706.

This was a suit against a physician and surgeon on behalf of the parents of a child who died on the operating table. The only important issue in the case was the parents' mental anguish and its bearing on the damages. While not deciding the right of the parents to recover damages in a proper case, the court held that this kind of a suit could not be maintained by them in their individual capacities, an administrator being the only one who could sue.

J. A. CASTAGNINO.

**Compensation for Inguinal Hernia—Attempted Release of Employer.** *Hines vs. Industrial Accident Commission (Cal.)*, 188 Pac., p. 277.

At the time the plaintiff, an employee of the Southern Pacific Railroad, was first employed, he was examined and found to have lax inguinal rings. He was informed of this defect, and in consideration of his employment he signed an agreement releasing the company from responsibility if a hernia developed. The provisions of the Workmen's Compensation Law of California, however, rendered this agreement ineffectual and therefore, under the law, the plaintiff was entitled to compensation.

J. A. CASTAGNINO.

**Circumstantial Authentication of a Roentgenogram—Admissible Evidence When Roentgenogram Is Lost.** *Quinn vs. Flesher (W. Va.)*, 102 S. E. R., p. 300.

In this case the radiograph was lost prior to the trial. Therefore the question as to whether the doctors who examined it could testify was raised. It was contended that the bones themselves were the primary evidence; that the picture was the secondary evidence; and that the statements of the

doctors as to what the lost radiograph contained would be tertiary evidence or knowledge derived only from a view of the secondary evidence. Inasmuch as the original condition of the bones had changed it would have been otherwise impossible to determine what their condition was at the time the radiograph was made. The court held that the radiograph was but a copy or reproduction of the bones, and that therefore it was proper for the doctors to testify concerning it if it became lost.

J. A. CASTAGNINO.

**Evidence and Rules of Evidence in Fracture Case.** *Dean vs. Seeman (S. D.)*, 176 N. W. R., p. 649.

In an action against a surgeon for malpractice in which negligence in the setting of a fractured femur was charged the court stated that displacement of the bone after it had been set and delay in its union did not necessarily imply that the physician was responsible for the result as long as he exercised ordinary skill and care.

J. A. CASTAGNINO.

**Negligence in Setting Fracture Not Established.**

*Ayala vs. King-Ryder Lumber Co., Louisiana Supreme Court*, 83 So., p. 799.

The plaintiff sustained a fracture between the knee and the hip. The evidence as to the treatment given by the attending physician is conflicting, the plaintiff contending that he first stuck a needle in the thigh and then tied a straight board to the outside of the leg; that no weights were used. The physician testified that he applied a Linton splint. His testimony was corroborated by a carpenter at the plant who made the splint under the direction of the physician and who was present when it was adjusted. It was shown the leg was an inch short, but the court held that the shortness was not due to the fault, neglect, or lack of skill of the physician.

J. A. CASTAGNINO.



# GYNECOLOGY

## UTERUS

**Bland, P. B.: The Treatment of Displacement of the Uterus.** *N. York M. J.*, 1920, cxii, 702.

This article is summarized as follows:

1. Therapeutically there is a distinct need for a specific line of division between medical and surgical malpositions.

2. The symptomatology of uterine displacements in general as taught today is erroneous. This is confirmed by the small percentage of so-called cures following operation.

3. Uncomplicated malpositions should be treated by medical and mechanical means. Operative measures should be applied to those associated with distinct surgical complications.

4. Operative intervention should not be utilized in the simple malpositions of virgins or young married women.

5. The infantile uterus never requires, and is not benefited by, surgery. Endocrine dysfunction as an etiological factor should be borne in mind. This condition should be treated rather than the uterus.

6. Nerve and muscle relaxation (backache) should be regarded as a causative factor rather than the result of uterine malposition.

7. Nerve and muscle power should be restored in all cases. This is best accomplished by rest and generous feeding.

8. In no case of retroflexion or retroversion will a recovery result when there is obstinate constipation or bladder overdistention. If the constipation is overcome the malposition will largely disappear.

9. The prolapsus of old women with low surgical resistance is best treated mechanically by the Menge pessary.

C. H. DAVIS.

**Heineberg, A.: Diseases of the Cervix Uteri.** *N. York M. J.*, 1920, cxii, 706.

The amount of cervical tissue to be removed is controlled by the extent of the erosion, endocervicitis, and hypertrophy present. Therefore it is advisable to reduce these pathologic changes by other methods of treatment in order to limit the extent of the amputation or to abolish the necessity for its performance. The secret of success lies in the preparation of the cervical mucous membrane for the reception of the active agent. Complete removal of the secretion cannot be effected by swabbing with gauze or cotton or by the use of a suction apparatus, and these methods, when persisted in, frequently cause bleeding which still further counteracts the action of the medicament. After experimenting with different methods, a weak alkaline solution made up of 40 gr. each of bicarbonate of soda, sodium chloride, and sodium borate to a pint of water was found to

dissolve or dislodge the cervical secretions thoroughly when used as an irrigating agent or when applied on an applicator. After the cervical mucous membrane is entirely clean, it should be thoroughly dried with absorbent cotton and the medicating agent applied. In aggravated cases of long standing, in which the mucosa is greatly thickened and the erosion extensive, the drug of choice is silver nitrate applied at first in 50 per cent solution every three or four days. As the discharge lessens in amount and becomes thinner and less purulent, the strength of the solution should be gradually decreased to 10 per cent.

If the cervix is large and boggy, the applications of silver nitrate should be supplemented with boric glycerin tampons until the cervix is reduced in size, and the patient should be directed to take alkaline douches once or twice a day.

In some cases after the treatment described an amputation is still necessary to reduce the hypertrophy and relieve the ectropion. In this connection the author describes the technique of a bloodless repair which he has used in over one hundred cases with very good results.

C. H. DAVIS.

**Knox, R.: The Treatment of Uterine Fibroids.** *Brit. M. J.*, 1920, ii, 535.

Knox advises X-ray treatment for uterine fibroids only after consultation with a surgeon and with the medical attendant. A brief review of the history of this form of treatment is given. The method of choice consists of the use of the Coolidge tube with careful screening and carefully estimated exposures in divided doses begun preferably soon after the last menstrual period. Two or more series of applications may be necessary, depending on the effect.

The action of the rays is exerted primarily on the ovaries and their blood supply; suppression of function leads to atrophy and cessation of menstruation. The rays have a direct effect also on the fibroids, causing as a rule a diminution in their size.

The following conditions are believed to contraindicate treatment with the X-ray and radium: (1) large fibroids, especially if calcification is present; (2) malignancy (surgery being preferable if the condition is operable); (3) infection of the pelvic organs; (4) inflammation of the neighboring organs, such as appendicitis, cystitis, etc.; and (5) submucous pedunculated fibroids.

The advantages of radiation are that it is painless and ill effects are only temporary; there is no interference with the normal daily life, except that moderate rest may be necessary one or two days after treatment; no pre-operative preparation is necessary; the symptoms of the menopause are less



marked than following surgery; and, as the patient is spared operative shock and hæmorrhage, recovery is more rapid, especially if she has been weakened by loss of blood.

The disadvantages of radium treatment are that a longer time is required to attain the desired effect, the results are not always successful, and the tumor does not disappear entirely.

The immediate effects consist of nausea, headache, and giddiness or faintness; the latter is usually due to ionized air and may be prevented by the use of an electric fan during the treatment. If late effects occur they come on usually from one to three days after treatment and are proportional to the dosage. Headache, a rise in the pulse rate and temperature, and a feeling of malaise are the most common symptoms. Indiscriminate use of the X-ray is dangerous because of the possibility of burns.

Judgment should be used in selecting the types of cases to be treated by X-ray and operation. The necessity for operation may be determined from the severity and frequency of the hæmorrhage, the size and rate of growth of the tumor, and the effects of pressure on other structures. Even when operation appears to be the best method in a given case the patient may be benefited by radiation if she is willing to risk the effects of intensive treatment.

The relative value of radium in the treatment of uterine fibroids must be considered also in discussing the X-ray as a therapeutic agent. The effect of radium and the X-ray depends upon the wave length; it is possible that the gamma ray of radium may produce results as good as, or better than, those produced by the X-ray. Radium, however, has the advantage of portability and accuracy of dosage. Both therapeutic agents in combination are very useful, especially when a rapid result is desired.

MERLE R. HOON.

**Panneton, J. E.: The X-Rays in the Treatment of Fibromata and Uterine Hæmorrhages.** *Am. J. Roentgenol.*, 1920, vii, 544.

Roentgenotherapy is employed most successfully in the following cases:

1. Small, simple fibromata characterized only by a sensation of weight or fatigue in the lower abdomen with menorrhagia.

2. Large fibromata, palpable through the abdominal wall, rising perhaps as high as the umbilicus, and accompanied by such symptoms as the mechanical type of constipation which is very difficult to overcome and is due to pressure on the iliac colon; frequent micturition due to diminution, by pressure, of the capacity of the bladder; and lumbar and sciatic pain due to pressure on the lumbar and sacral flexures. The menstrual periods may be normal as to the amount of flow and duration or slightly increased.

3. Fibromata of any size accompanied by more or less severe hæmorrhage.

4. In uterine hæmorrhages of non-infectious origin, and in certain painful menorrhagias without demonstrable fibroids.

5. Uterine hæmorrhages with subinvolution or the hæmorrhages preceding a delayed menopause.

In all these cases the results obtained warrant the use of the terms "cure" or "clinical cure" provided the dose administered was considerably more than that actually necessary to produce the menopause. The treatment of young women is necessarily more prolonged than that of older women, the time required being in inverse proportion to the patient's age.

The author reports the results of 44 cases. The technique used was that described by Bécclère. The two ovarian regions were irradiated by directing the rays obliquely through the uterus through only two anterior ports of entry. In women more than 40 years of age the arrest of the hæmorrhage and menstrual function was obtained after the third or fourth application (parallel gap of 20 to 22 cm.; 3 mm. of aluminum for filtration; radiant energy equivalent to 16 X). In women 50 years of age such a dose produced the menopause; in 1 case after the first treatment, and in 3 cases after the second treatment. In younger women between 30 and 40 years of age, the menopause was not established until after the fifth, sixth, or seventh application.

The number of applications required to cause the disappearance of fibromata varied from five to ten series, according to the size and age of the growths. As a rule these tumors disappeared entirely but in some cases the uterus remained slightly enlarged. Some of the large tumors disappeared completely and 7 or 8 retrogressed behind the pubis, leaving the uterus somewhat enlarged.

In certain cases the author tried the method of multiple port of entry, using eight anterior and eight posterior ports. In his opinion the menopause was not obtained any more rapidly by this method than by the method of Bécclère which was much more simple. On the contrary he noticed that with the method of several ports of entry the patients often experienced malaise, vertigo, nausea, or even vomiting to a much greater degree than when only two ports of entry were used.

In serious cases in which immediate action is indicated Panneton does not hesitate to give a dose of 30 or even 40 X. This has an excellent effect upon the hæmorrhage.

When thick filters are used the effect upon the skin is nil; the author has never observed telangiectasis except in some of his first cases in which a 1 mm. filter and a parallel gap of 15 cm. were used.

W. L. BROWN.

**Ernesto, R. R.: Cancer of the Uterus in Lima** (El cancer del utero en Lima). *An. Fac. de Med. Univ. de Lima*, 1920, iii, 64.

The author discusses the mortality due to cancer and suggests methods by which it may be decreased. The statistics reviewed are based first on



the population of Lima, and second, on the incidence of cancer of the uterus in relation to cancer found elsewhere in the body. The last census of Lima was taken in 1908, but the author's studies were carried through 1918.

Between the ages of 35 and 40 the mortality due to cancer of the uterus per 10,000 inhabitants is 5.7 while between the ages of 45 and 50 it is 13.4, and between the ages of 60 and 65 it is 14.4.

The uterus is involved in 98 per cent of the cases of cancer of the female generative organs. Of 1,090 deaths due to cancer, 364 were due to cancer of the uterus. The stomach and liver are the second most frequent sites of malignancy and the breast third. These statistics differ from those of other countries of South America, but are very similar to those of Rio de Janeiro. The mortality differs according to race, being highest among Indians, lower among the negroes and whites, and lowest among mixed races.

In discussing the etiological factors the author states that in his opinion heredity is probably not a cause. The beginning of the menopause is perhaps the most usual time for the appearance of cancer. Cancer of the uterus is most infrequent in nulliparæ and most common in multiparæ. The propagation of cancer by contact is not probable. Traumatism such as tears or inflammation may be considered as etiological factors. PIO BLANCO.

**Ramón y Cajal, P.: The Action of Radium in Cancer** (Acción de la radium actividad en el cancer). *Arch. de ginec., obst. y pediat.*, 1920, xxxiii, 227.

Radium produces two simultaneous effects in the tissues; namely, regressive changes followed by rapid death of the neoplastic tissues, and stimulation of the natural defensive reactions. When a neoplasm has been destroyed by radium there is an attempt at repair of the tissues invaded. This process is similar to that observed in the same kind of tissue which has not been treated with radium, but in which the changes are complete or partial.

The changes taking place in the structure of undifferentiated cells exposed to radium consist of new cell formation and increased nutrition of the cell even though the cell finally succumbs. Some cells resist the action of radium and fail to develop further, but if again stimulated they assume a very rapid growth. Many of the undifferentiated cells may become differentiated through the action of radium.

The author points out that the structure of a cancer cell is that of the embryonic undifferentiated cell. PIO BLANCO.

**Taussig, F. J.: An Analysis of the Failures in Radium Treatment of Cervical Cancer.** *Am. J. Obst. & Gynec.*, 1920, i, 113.

The author states that we should direct our efforts not so much to reporting occasional successes but to analyzing our still too frequent failures. In his opinion, based on two and one-half years' experience, cervical cancer should be treated by a gynecologist who

has had special training in the use of the X-ray and radium. In regard to dosage Taussig has found that while heavy radiation with the gamma rays may not show unfavorable results at the time, it has a tendency to produce an obliterative endarteritis which, when subsequent treatments are given, favors profound necrosis of normal tissues, the dreaded complication of radium treatment. For this reason the attempt should be made to obtain a cure in the first treatment extending over a period of four weeks as it usually takes at least six weeks for the tissues to show the full result of a heavy radium treatment.

Taussig's technique in the inoperable stage of cervical carcinoma consists of the application of 25 to 50 mg. within the cervix and from 75 to 100 mg. in silver capsules packed against the cervical ulcer for twenty to twenty-two hours, a total of 2,500 to 2,750 milligram hours. Two weeks later a massive X-ray dose through six to eight portals is given.

Among the serious sequelæ of radium treatment, septic infection demands first consideration. The cases of pelvic peritonitis which so often develop are due rather to the infected tube or uterus than to an infection resulting from the introduction of the radium. Frequently a pyelitis will light up, causing a so-called "radium fever." Severe hæmorrhage occurred in 8 cases as a result of radium necrosis which affected a branch of the uterine artery. The bleeding was more profuse than in an untreated case. Most annoying are the fistulæ. In Taussig's opinion these tend to form after repeated moderate doses of radiation with the gamma rays.

Six patients with primary vaginal cancer and six with vulvar cancer were treated with radium. One remained free from recurrence, 3 died, 1 had a recurrence when heard from last, and 1 was not traced. In the cases of vaginal cancer, however, the results of operation in even the very earliest cases are so poor that radium treatment is to be preferred. Carcinoma of the vulva on the other hand, is most unsuited for radium treatment. On account of the free nerve supply in this region radium reaction produces severe and prolonged burning and pain. Moreover, the local retrogressions are slow and incomplete and the glandular metastases which occur so uniformly in this form of cancer seem to appear earlier and grow more rapidly when radium has been used. Only 1 of the author's patients is at present alive and in this case excision of the vulva and tributary glands was combined with the use of radium. Unquestionably surgical measures will give better results although an occasional cure, as in Janeway's case, may follow radium treatment.

The article is summarized as follows:

1. Radium treatment of uterine cancer should be kept in the hands of the gynecologist rather than the roentgenologist, but the gynecologist should seek preliminary training in the use of radium and should have continued opportunity for the observation and treatment of cancer.



2. Good permanent results may be obtained in a certain proportion of cases of cervical cancers with amounts of radium not exceeding 100 or 150 mgm. of the element, through the use of large amounts in the form of emanation will doubtless decrease complications and increase the number of cures to some degree.

3. If possible, all necessary treatment should be given within the first six to eight weeks before sclerosis has rendered the cancer less accessible and the normal tissues more susceptible to injury.

4. Tumor infiltration or light metal filtration together with intracervical application does the most good and the least damage; from 2,500 to 3,500 milligram hours are usually enough to give results in the favorable cases.

5. In the absence of the Bailey bomb and large amounts of emanation, well-directed and prolonged X-ray treatment through six to eight portals will usually affect the parametrial and glandular involvements.

6. Prolonged necrosis and fistulæ are due to repeated treatments, vaginal applications, heavy radiation with the gamma rays, or a combination of the three.

7. Rectovaginal fistulæ are more frequent and vesicovaginal fistulæ less frequent after radium treatment.

8. Operation is to be preferred in all operable cases when the patient is under 35 years of age and in the early operable cases when the patient is beyond this age. Radium is to be recommended whenever obesity or lung, heart, or kidney lesions makes operation difficult or dangerous, and in advanced operable, borderline, and inoperable cases, but not in the advanced inoperable group with cachexia. W. L. BROWN.

**Recasens: The Present Position of Radium and Radiotherapy in the Treatment of Uterine Cancer** (État actuel de la radium et de la radiothérapie dans le cancer de l'utérus). *Presse méd.*, Par., 1920, xxviii, 633.

Forty-seven patients with cancer of the uterine cervix were treated with radium during the year 1914. In 26, the condition was at the limit of operability, and in 21 was quite inoperable. Today, 11 of these patients are perfectly well except that 2 of them have a vesicovaginal fistula.

From 1917 to 1919 inclusive 15 of the patients treated in 1914 died of recurrences. These patients were reported as cured in the statistics published by Recasens in 1917. This still leaves 24 per cent of those treated in 1914 who have remained well for more than five years. Of the women treated in 1915, 21 out of 79 are completely cured, a percentage of recovery after four years amounting to 25.6. These figures give irrefutable testimony regarding the possibility of definite recovery in cases of inoperable cancer of the uterine cervix following radiotherapy.

In certain cases in which, because of the extent of the growth, it did not appear probable that radium would be of benefit, very penetrating doses

of X-rays (120,000 volts, 2 millamperes, Coolidge tube) were given for one hour on each iliac fossa, the same dose being repeated on the two sides of the sacrum and the lateral iliac region on days following the first application. Two days after these applications microscopic examination of specimens did not reveal any changes, but ten days later cellular lesions comparable to those produced by radium were found. The action of X-rays on cervical cancer is slow and of itself is insufficient to cause the disappearance of all of the cancer cells, but it aids in the destruction of epithelial nests which, because of their distant situation, cannot be reached by radium irradiation. The X-rays act also very efficaciously on cancer cells of the pelvic glands and lymphatic propagations.

In the treatment of uterine cancer with radium the author uses the gamma rays alone. The effect of these rays varies from simple irritation to complete cellular destruction. Between these limits there is a series of states of inhibition. These differences in the action of radium are due to two factors: (1) the quantity and quality of the rays received by the tissues in relation to the duration of the irradiation, and (2) the difference in the absorbing power of the tissues.

A phenomenon which the author noted following massive radium dosage and which he never observed in X-ray irradiations was a phase of nuclear gigantism preceding the phase of destruction.

Recasens does not believe that the milligram-hour unit is of any value. He uses tubes of 70, 30, or 50 milligrams, leaving a tube in place from ten to eighteen hours. In general, he does not continue the application longer than twenty-four hours unless the cancer is situated within a cavity in which the tube is surrounded on all its length and surface by cancerous tissue. The treatments are given every eight days in series of five or six applications. Then, after an interval of three or four weeks, a new series of two or three applications is given, after which the patient is allowed to rest for two months. The treatment is concluded with a few local applications according to conditions.

Radium treatment is supplemented in all cases by X-ray treatment and the author is convinced that the good results he is able to report are due to the combination of these two therapeutic agents.

The basis of the technique followed is the utilization of the actions of accumulation and latency which preserve the cells when they have undergone an irradiation not sufficient to kill them immediately. This latency of irradiation and accumulation of doses is in reverse relation to the quantity of radium employed and the duration of the application. Large doses produce immediate effects and medium doses cause latency and accumulations which are of great value in the treatment of cervical cancer.

For cancer of the corpus uteri the author at present prefers operation, but thinks that in time it will yield to radiotherapy.

For some years Recasens has sought for a method of increasing the sensitiveness of cancer cells to



radiation. The results of experiments with local diathermic treatment have not been encouraging. Following intravenous injections of colloidal copper, platinum, and electro-selenium, however, he has found changes in neoplastic cervical cancer which are analogous to, if not identical with, those observed after irradiation with radium and the X-rays. In certain cases amelioration of the local symptoms was observed also.

In all cases in which radium was employed after treatment with colloidal copper the symptoms of cervical cancer disappeared more rapidly than when radium was used alone.

W. A. BRENNAN.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Bell, W. B.:** *The Nature of the Ovarian Function and the Medical and Surgical Methods Adopted to Secure the Benefits of the Ovarian Secretions.* *Lancet*, 1920, cxcix, 879.

The author endeavors to formulate conclusions regarding the teaching and practice of gynecologists with respect to the conservation of the ovaries when conception is impossible. He believes that conservation of ovarian tissue has a sound basis not only in the surgical principle of preserving important organs, but also in the results obtained. The ultimate decision as to the value of leaving ovarian tissue must be based on a demonstration of benefits accruing therefrom.

In the absence of precise knowledge concerning the factors which determine sex and which doubtless are present in the fertilized ovum, we can follow only the later manifestations which are the result of the progress of development of the determined sex. The primary sex characteristic is the predominance of maleness or femaleness in the fertilized ovum. This may be so slight as to be disturbed even in the human subject. A fact of interest is that the cortex of the suprarenal gland is developed in close proximity to the genital gland and at the same period. If, therefore, there is a determining factor in regard to the sex gland and the other tissues, such as the Muellerian ducts, etc., it is certain that the suprarenal cortex will come within the sphere of influence. The thyroid and the pituitary are also relatively much larger in the foetus than in the adult. All the internal secretory glands control the sex functions, sex characteristics, and sex metabolism from the beginning as much as the gonads, and primarily all owe their directive tendencies to the predominating sex potentiality in the zygote. The secondary characteristics of sex are dependent on the suprarenal cortex and the pituitary more than on the gonads.

If a lesion of the suprarenal cortex leading to increased secretion turns the secondary characteristics of a female into those of a male and suppresses the function of the ovaries, it is only logical to suppose that, while normal, it had been feminine rather than masculine in type, quantitatively or qualitatively. The metabolism of the organism concerned is also altered. Partial hermaphroditism illustrates

this sex determination. The testes in partial hermaphrodites are never functional, the seminal tubules always remain undeveloped, and the interstitial cellular tissue in which the seminal tubules are embedded is so abundant that almost the entire organ appears to be composed of epithelial cells. If it were true that the interstitial cells of the gonads are responsible for the secondary characteristics, it could hardly come about that when they are seen at the highest state of development, as in partial hermaphrodites, every other characteristic would be definitely that of the opposite sex. In some cases male (testicular) partial hermaphrodites have had every appearance of beautiful women as regards both mind and body.

The direct effect of ovarian function is the regulation of the production of ova and the control of the normal uterine cycle. In this connection other organs of internal secretion, the thyroid and pituitary, are concerned as is demonstrated by the rapid atrophy of the genital glands and ducts following certain operations on the pituitary gland. The indirect effect of ovarian function is the promotion of the menstrual cycle. In this cycle the mammae must be kept potentially functional. Nutrient is first conveyed to the child *in utero* by the blood stream of the mother and afterward through the medium of the mother's milk. This adjustment is regulated by the organs of internal secretion following sensitization of the mammae possibly by the secretion of corpus luteum and the substances elaborated by the foetal metabolism. The metabolism of the mother is based on the same requirements during lactation as during gestation. After removal of the ovarian secretion by oophorectomy the thyroid gland especially appears apt to undergo pathologic changes. The sympathetic control, always somewhat unstable in women, becomes more variable because of changes that take place in the calcium metabolism which is largely concerned in the reproductive processes. The general metabolism is considerably reduced after oophorectomy as shown by the consumption of oxygen and excretion of carbonic acid gas. Young, sexually active women suffer very grievously if the artificial menopause is induced. As to therapeutic measures, it is doubtful whether ovarian extracts alone are capable of producing desirable results. While some authors consider the corpus luteum as the most active, Bell has shown that the interstitial cells probably preserve the integrity of the uterus and the function of menstruation. Whole ovarian extract combined with thyroid extract should be used in circumstances for which such treatment is required. Extracts are of little service in the physiological menopause but the combined extracts, that is, of whole ovary and thyroid, are of value following oophorectomy.

The practice of ovarian grafting is considered an accessory method. In 98 cases only five ovarian grafts were employed in the absence of pelvic infection. The following points with regard to the technique of this procedure are important:



1. All grafts in the human subject must be autoplasmic.

2. After the removal of the ovaries the ovarian tissue from which the graft is to be cut should be dropped to the bottom of the pouch of Douglas where it will be kept warm and moist until the end of the operation when it is to be grafted.

3. When possible, healthy ovarian tissue (which may include all the elements of the organ) should be used. After the dense tunica albuginea has been removed this tissue should be criss-crossed with a sharp knife into adherent fragments in order to favor rapid vascularization of the grafted tissue.

4. If there is no suppurative infection of the ovary, the graft may be placed in the rectus muscle before the laparotomy wound is closed, or may be implanted in the uterus. It is most important that it should be placed in a vascular site, but not surrounded with blood.

5. If the ovaries are badly infected and more or less completely converted into the walls of abscess cavities, whatever tissue can be removed should be implanted in the internal oblique muscle alongside the drainage tube which, in such circumstances, is passed through a stab-wound well away from the central incision into the pelvis. In several such cases menstruation has occurred subsequently, but is regular after ovarian grafting in only a few. Usually it recurs at intervals longer than normal, that is, every six weeks or two months. Some patients menstruate a few times and then have minor symptoms of the menopause. The longest period during which any patient menstruated regularly was four years.

W. N. ROWLEY.

**Ochsner, E. H.:** Further Observations on the Function of the Corpus Luteum. *Surg., Gynec. & Obst.*, 1920, xxxi, 496.

According to our present conception, the ovary is a complex glandular organ with at least two quite distinct functions: first, the production of ripe ova and, second, the elaboration of one or more internal secretions. Veterinarians have observed that if a false corpus luteum remains unabsorbed in either ovary of a cow, she does not come in heat nor conceive. On the other hand, as soon as this false corpus luteum is absorbed normally or expressed manually by the operating hand of the veterinarian, the phenomenon known as heat invariably develops within from forty-eight to one hundred and twenty hours.

Pelvic infections have long been recognized as the cause of sterility in the human female. There are a considerable number of patients with premature menopause who give the history of having stopped menstruating because of a severe chilling during a menstrual period and who have never menstruated since. Another considerable number of patients are those who, following a chilling or a severe illness during a menstrual period, have menstruated only at intervals varying from several months to several years and have suffered from the distressing symp-

toms of an artificial menopause. In view of the facts mentioned with regard to the cow, the author would today perform a laparotomy on such patients, carefully examine the ovaries, and if an unabsorbed corpus luteum is found, would excise it.

Eleven cases are given with the results obtained by operation. The conclusions arrived at are as follows:

1. An unabsorbed false corpus luteum prevents ovulation and is a common cause of sterility. The expression or excision of such a false corpus luteum invariably brings on menstruation.

2. The excision or rupture of a true corpus luteum invariably results in the interruption of pregnancy, at least during the early months, and may be looked upon as a common cause of abortion.

3. An injury to either the true or false corpus luteum may simulate ruptured extra-uterine pregnancy.

C. H. DAVIS.

**Hartmann, Bergéret, and Remilly:** Reflections upon Tubo-Ovarian Tuberculosis Based on 28 Personal Cases (Quelques réflexions sur la tuberculose salpingo-ovarienne à propos de 28 observations personnelles). *Gynec. et obst.*, 1920, ii, 3.

Tuberculosis of the adnexa of the uterus has been known for a long time, having been described by Morgagni in 1744. Published statistics vary widely and therefore give little idea as to the frequency of the condition. The authors found adnexal tuberculosis in 28 out of 1,150 cases of adnexitis operated upon. Williams at the Johns Hopkins Hospital found tuberculosis 7 times in 91 cases of adnexitis and in only 2 of these cases had it been suspected previously.

The ages of the authors' patients varied from 18 to 47 years. There was a personal history of tuberculosis in about one-third of the cases and a family history of tuberculosis in 8.

Tuberculosis limited to the tube was observed only once. In all the other cases the disease had involved the neighboring peritoneum. The lesion was unilateral in 7 cases, and bilateral in 20. In 4 of the latter it was almost exclusively peritoneal.

Tuberculosis of the adnexa is almost always associated with periovaritis, but the ovary itself is rarely involved. In 1 case a tuberculous ovarian abscess was discovered and in 5 others invasion of the ovary appeared certain. In 8 cases there was a cystic condition of the ovary. The authors never found an ovarian abscess without associated tubal suppuration.

In 13 cases the peritoneal lesions were limited to the peritoneum of the lower pelvis which was covered with granulations. In 13 cases also the lesions extended to the abdominal peritoneum. A fistula to a neighboring organ was found in only 1 case and in this instance involved the pelvic colon.

The presence of tuberculous uterine lesions was certain in some of the authors' cases, but in only one instance was tuberculosis of the urinary tract associated with the genital tuberculosis.



Regarding the pathogenesis the authors state that none of their cases favors the theory of an ascending route of infection. In their opinion it is possible that tuberculosis of other organs reaches the ovary by the descending route, but as a rule the route is through the blood. A large proportion of the authors' cases showed the presence of previous tuberculous foci.

The clinical syndrome presented in the cases reviewed varied considerably. In 14, the syndrome was that of genital tuberculosis in the form of adnexitis, with or without pelviperitonitis, while in 13 cases it was that of fibrocaceous tuberculous peritonitis of genital origin. Both these types appeared in all intermediate forms. Ascitic tuberculous peritonitis of genital origin is rare and was seen in only 1 case.

All of the authors' patients were operated upon. Four were treated by unilateral castration and all recovered. In 10 cases a bilateral castration with hysterectomy was done. One of these patients died during the operation, and 2 others, within a short period afterward. Only 7 of the patients could be traced. Three of these who had had a total castration were in perfect health from two to three and one-half years later. Four patients who had had a unilateral castration were in good condition from one to eight years after the operation. Three patients died of tuberculosis subsequently.

W. A. BRENNAN.

**Caviglia, A., and Luzurriaga, A. M.: Two Cases of Hydatid Echinococcosis of the Female Genitalia** (Dos casos de equinococosis hidática del aparato genital femenino). *Rev. d. cir. med. argent.*, 1920, xx, 609.

The author points out the importance of the X-ray and especially of an exploratory laparotomy in establishing a diagnosis of echinococcus cyst primary in the female generative organs (the uterus and adnexa). Without an exploratory laparotomy it is impossible to make a certain diagnosis as vaginal exploration is insufficient.

Primary echinococcus cysts of the uterus or adnexa may be multiple or single. Ninety-five per cent of those in children are single.

Echinococcus cysts in the uterus and adnexa or the external genitalia are usually secondary to cysts in some other part of the body. In one instance the author found cysts in the omentum and the broad ligament. The cyst in the omentum was in a state of degeneration and that in the broad ligament in a state of development.

The migration of the echinococci to the uterus and female genitalia takes place through the circulation. After passing through the lungs they are distributed to all parts of the body through the left heart. Only by this theory is it possible to account for the presence of intramural echinococcus cysts and cysts in the broad ligaments and the vulva. The theory that the echinococcus is introduced from the outside through the vagina is not acceptable. Direct penetration of the echinococcus through the rectal walls and the pouch of Douglas is not probable.

A diagnosis of echinococcus cyst of the female genitalia has seldom or never been made clinically, but is always made at the time of operation.

The treatment must be radical as it is very seldom possible to enucleate the cyst.

The author reports two cases of single cyst of the ovary and tube which were probably primary in these locations.

PIO BLANCO.

## EXTERNAL GENITALIA

**Demarest: Major Vaginal Prolapses; Definite Cure by Means of Total Colpectomy.** *Am. J. Surg.*, 1920, xxxiv, 285.

Major vaginal prolapses include those which are characterized by complete eversion of the vaginal wall. The author discusses the etiological factors concerned in this condition and gives several very good photographs of cases. The technique employed in the treatment is as follows:

1. Vaginal hysterectomy or cervicectomy, according to whether the uterus or only the cervix is present.

2. Colpectomy.

**Hysterectomy.**—The vaginal walls are painted with tincture of iodine and a circular incision is made in the vaginal mucous membrane a little above the lips of the cervix. The plane of cleavage between the uterus and bladder is located, and these organs are separated up to the peritoneal deflection. In order to open the peritoneal cul-de-sac easily the anterior wall of the uterus is divided in the center up to the fundus. The upper portion of the broad ligament is then sectioned close to the uterus on either side. This having been done, the uterus is easily revolved forward and the cul-de-sac of Douglas is exposed. The dissection is then continued through the posterior vaginal incision so that the cul-de-sac of Douglas is exposed in its entirety. The uterine pedicles are seized, cut between Kocher clamps, and ligated. The breach in the peritoneum is easily closed when the two surfaces are approximated. This suture should be as high as possible.

**Colpectomy.**—A median longitudinal incision is made down the entire length of the mucous membrane of the anterior vaginal wall and the mucosa gently separated upward along the plane of cleavage to about 1 cm. behind the urethra and laterally to its full extent. Below, in the area corresponding to the pericervical tissue, the separation is a little more difficult and may be accompanied by considerable oozing which is increased because the circular incision has been made close to the cervix. To carry this incision further away from the cervix might seem a simple expedient to prevent this inconvenience, but in practice such an incision might endanger the bladder. With the bladder liberated and the separation completed on either side, the same procedure is repeated posteriorly, a posterior median incision being made, and the posterior vaginal mucous membrane is separated down to the fourchette. Here again the oozing is most abundant



near the cervix. The final step consists of resection of the vaginal wall, sufficient tissue being left for vertical suture without much traction.

C. H. DAVIS.

**Peters, H.: Transverse Stenoses of the Vagina** (Zum Kapitel der queren Scheidenstenosen). *Monatsschr. f. Geburtsh. u. Gynaek.*, 1920, li, 363.

Transverse stenoses of the vagina are of two types, congenital and acquired. The latter are usually due to ulcerative processes following infectious diseases, obstetrical trauma, or gynecological treatments. The cause of the congenital type is as yet not clear. As a rule there is no evidence of intra-uterine infection and it is a question whether the condition is due to congenital rests of a solid vaginal cord or to agglutination of the walls of a fully developed vagina. It is certain, however, that the congenital non-inflammatory stenoses bear a close relation to the hymen, and the literature shows that this developmental anomaly is frequently associated with others.

The author reports six cases in which there was no history of an infection or obstetrical trauma (all the patients were primiparæ) and no evidence of other developmental anomalies. In five cases the stenosis was in the lower third of the vagina directly under the hymen.

The walls of a congenitally stenosed vagina are usually thin and therefore hæmorrhage is quite common after coitus or labor. The bleeding may be arrested easily, however, by light tamponade. The chief danger consists in the fact that during expulsion of the child in labor the lacerations are torn further, severe hæmorrhage may result, and, because of the extensive wound, there is greater chance of infection.

For more fleshy stenoses the author recommends prophylactic discision or excision of the obstruction.

The prognosis is usually favorable even though, according to Neubauer's statistics based on 1,000 cases (including 303 cases of parturient women, 23 of whom had a Porro operation, 35 a conservative section, and 245 a normal labor) the mortality was 10 per cent. Even today, however, the stenosis may recur, necessitating operative interference or dilatation in later labors. Labors without complications, therefore, are in the minority.

A. ROSENBERG (Z.).

**Proubasta, F.: A Case of Acquired Vaginal Stricture** (Un caso de estrechez vaginal adquirida). *Rev. españ. de med. y cirug.*, 1920, li, 525.

The author's patient was 24 years of age. The external genitalia were normal. The examining finger introduced into the vagina was stopped at a distance of 4 cm. by an obstruction on the left side formed by the vaginal walls. The stricture could be passed by a fine sound. The history disclosed that the condition was due to an infantile vaginitis and was analogous to hæmorrhagic stricture in the male. Obstruction to uterine drainage had caused an

endometritis. Excision of the strictured tract was possible but not expedient as it would leave a scar which, if the patient became pregnant, could not be cleared by a fetal head.

On more detailed examination the author found a congenital cervicovaginal band extending from the anterior surface of the cervix to the left wall of the vagina.

Proubasta treated the case by digital dilatation with the two crossed index fingers. Subsequently the patient gave birth without difficulty to a living child weighing 3 kilos.

The author draws the following conclusions:

1. When an infantile vaginitis resists treatment the presence of a stricturing band should be considered.
2. Dilatation may be an efficient method of treating acquired vaginal strictures even when the lumen is extremely small.
3. One hand alone is insufficient to dilate a stricture. If the fingers can reach the ischiatic spines the dilatation is sufficient to permit birth.

W. A. BRENNAN.

**Stevens, W. E., and Heppner, M.: Gonorrhœa of the Lower Genito-Urinary Tract in Women, with Special Reference to the Glands of Bartholin.** *J. Am. M. Ass.*, 1920, lxxv, 1477.

The author found chronic gonorrhœal infection in 1,496 of 3,439 examinations (approximately 43.5 per cent). In the first 2,375 cases the diagnosis of gonorrhœa was based on the detection of the organism in the smears or a double plus or triple plus complement fixation test, together with characteristic clinical findings. It is probable that many cases were overlooked even when repeated examinations were made as the difficulty of detecting gonococci in women, especially in chronic infections, and the fallibility of the complement fixation test in its present form are universally recognized.

In the last 1,064 examinations positive clinical findings were usually considered sufficient evidence of gonorrhœa. The correctness of this assumption was confirmed by the discovery of the gram-negative organisms in approximately 95 per cent of these patients at some time during their stay in the hospital. The infection was located in the cervix in approximately 47 per cent, in the urethra in 32 per cent, and in one or both Bartholin glands in 23 per cent. Smears were never positive in the absence of infection of the cervix. In the presence of cervical infection the complement fixation test for gonorrhœa was positive in approximately 59 per cent, in urethral infection in 23 per cent, and in bartholinitis in 19 per cent. In the last 50 cases examined, however, the complement fixation test was positive in every instance regardless of the location of the infection. The same type of antigen was used in all.

The author examined the Bartholin glands with the X-ray, using a 50 per cent suspension of barium sulphate in liquid petrolatum. This mixture is readily injected through a No. 19 Luer needle, the



end of which has been blunted. Following the injection of from 1 to 1.5 c.cm., roentgenograms were made on dental films inserted into the vagina.

Even in the presence of patent ducts, it is impossible to obtain roentgenograms of the small, sclerosed glands resulting from chronic infection. Treatment by injections of a number of different solutions, including acriflavine and mercurochrome, proved of little or no value, and these were therefore discarded in favor of excision which is without question the procedure of choice in all acute and chronic pathologic conditions of the glands of Bartholin. The authors describe their technique and draw the following conclusions:

Gonorrhœa in women occurs more frequently than is generally supposed, and should be accorded more attention than it has heretofore received.

The persistence of gonorrhœal urethritis is usually due to glandular involvement or strictures at the meatus or within the canal.

Strictures of the urethra are common, especially at the meatus, and should receive treatment.

The ducts and glands of Bartholin are frequently infected by the gonococcus.

Injections are of little value in the treatment of infected glands.

Urethral glands must be destroyed and Bartholin glands excised.

The entire Bartholin gland must be removed; otherwise, abscess formation is apt to occur.

Neither the absence of demonstrable gonococci nor occlusions or strictures of the ducts are contraindications to the removal of the glands of Bartholin.

E. L. CORNELL.

#### MISCELLANEOUS

**Mock, H. E.: Gynecological Problems in Industrial Medicine.** *Am. J. Obst. & Gynec.*, 1920, 1, 131.

For efficiency, an industrial health department should include the following activities:

1. The prevention of disease and accidents by: (1) a study of the nature of the work, the possibilities for occupational diseases, and methods of preventing them; (2) safety methods, educational campaigns, and a study of every cause of injury in order to prevent new accidents; (3) industrial sanitation including the home conditions of the workers, the removal of dust, gases, etc., ventilation, illumination, eating places, sewerage and garbage disposal, cleaning, care of toilets and cuspidors, etc.; and (4) a study of the physical condition of employees as related to their occupation.

2. The supervision of the health of employees by: (1) a physical examination of all applicants for work in order that employees may be placed according to the formula, "physical qualifications plus occupational qualifications equal the job", and again that those who cannot be employed with safety to themselves, to others, or to property may be eliminated; (2) a physical examination of old employees at stated intervals or whenever

indicated; (3) health talks to individuals and groups and personal advice; (4) the development of proper habits of exercise, bathing, diet, etc. among the employees.

3. Adequate medical and surgical care by: (1) supervision of the type of medical care received from outside physicians; (2) the provision of proper medical care for certain types of cases; (3) the provision of the best surgical service for all injured employees.

4. Nursing service by the provision of trained nurses to assist the plant physician, to render certain forms of first aid, to see that the sick employees receive proper care, to assist by certain nursing duties, and otherwise to show the friendly interest of the employer in the sick employee.

The practicability of examining female employees has been demonstrated in a number of large industries throughout the country. Some of these employ women physicians and subject every girl employee to a complete examination but in the majority only a partial examination including the head, neck, and chest is given. Careful history taking and questioning usually reveal abdominal or pelvic symptoms which indicate a more thorough examination. Before the pelvic examination is made the consent of the parent or some relative should be obtained. The examination should always be made in the presence of a nurse, and in the cases of virgins, under nitrous oxide anesthesia.

There can be no greater aid to efficiency in an industry than a properly located, adequately equipped rest room, especially where girls and women are employed. In visiting numerous concerns the author often found that the rest rooms provided for the girls are located in some dark, out of the way corner or are part of the equipment of the toilet rooms. Wherever women are employed, clean, airy rest rooms removed from excessive noise should be provided. They should be furnished with single beds, instead of hard cots, clean pillows and sheets, and warm blankets. A nurse or some qualified matron should be in charge. The beds should be separated with screens to furnish privacy. The room should be kept cool and well ventilated and its appearance should be restful.

For every five hundred girls employed there should be at least five toilets. Bubbling fountains should be located near the working places. The toilet rooms should be kept clean and well ventilated. Washing facilities should be in the same or an adjoining room. Receptacles for refuse and supplies of sanitary napkins should be provided.

High-heeled shoes, loose skirts, and flowing sleeves are hazardous in occupations about machinery. During the war one state factory inspector found that in a large industry where the men had been largely replaced by women employees there was a 50 per cent increase in the number of fractures as compared with the year before. He claimed that in 75 per cent of these cases high-heeled shoes were responsible for the accident.



From an analysis of fifteen thousand cases of absence from work on account of sickness it was found that headache was the cause of 24 per cent, and dysmenorrhoea the cause in 18 per cent. The author discusses the two conditions at some length.

The most common medicolegal gynecological condition complained of by employed women as the result of injuries sustained is backache associated with pelvic disorders, displacements of the uterus, miscarriages, and dislocation of the coccyx.

C. H. DAVIS.

**Nuernberger, L.: Experimental Investigations of the Dangers of Raying as regards Fertility** (Experimentelle Untersuchungen ueber die Gefahren der Bestrahlung fuer die Fortpflanzung). *Prakt. Ergebn. d. Geburtsh. u. Gynaek.*, 1920, viii, 163.

The author endeavored to determine the effect of actinotherapy (X-ray and radio-active substances) upon the germ cells of the testicle and ovary and especially on the offspring of those treated by radiation. His conclusions are as follows:

The changes in the testicle due to raying consist primarily in injury of the semen-producing epithelial layer. They are most severe in the elements forming the seminal secretion. The fully developed spermatozoa are very resistant to the rays. Epithelium not completely destroyed has considerable regenerative power.

The ovary is affected most in the germinal epithelium but here there is no regeneration of the specific germinal tissue. After recovery the gland functions only through the follicles not destroyed.

The question as to whether raying of the testicle and ovary may be the cause of a pathologic condition or subnormality of the offspring is to be answered in the negative. In spite of numerous variations in his experiments the author was never able to produce any deviations from the normal in the offspring of the animals rayed. Even on further breeding of these animals he was unable to demonstrate any injury of, or deviations in, the genital organs. Occasionally it was shown that the specific cells were not killed immediately but that the power of fertilization persisted for about twenty-four hours longer. The offspring of even this latent period were perfectly normal. After this latent period fertilization was usually no longer possible. If the raying did not lead to permanent sterility and if regeneration of the glands occurred, perfectly normal offspring were born.

Observation of clinical cases has not revealed a single instance of injury to the offspring due to radiation. Therefore patients with myomata and hæmorrhagic metropathies who have not reached the menopause may be rayed until temporary sterilization has occurred without danger. HARMS (Z).

**Rolando, S.: Operation for the Removal of a Foreign Body Which Entered the Peritoneum by the Genital Route** (Intervento operativo per corpo estraneo nel peritoneo penetrandovi dalle vie genitali). *Riforma med.*, 1920, xxxvi, 984.

Cases in which foreign bodies have entered the peritoneum by uterine or vaginal perforation and have been tolerated there are not very common.

The case described by the author was that of a woman 30 years of age. On examination a small painful tumefaction was found in the lower left quadrant of the abdomen. The pain increased and became paroxysmal on pressure or change of position. The mass was hard, fixed, and tympanitic. The uterus and adnexa appeared normal, but on exploration a hard cord could be felt which was continuous with one part of the tumorous mass in the left iliac fossa and extended toward the right iliac fossa. A radiograph showed no stenosis in the descending or pelvic colon.

Diagnosis was reserved until the woman confessed that an attempt at abortion had been made by a midwife about three months before by the introduction of a long catheter into the vagina. The catheter, which had been left *in situ*, had escaped but its disappearance had been followed by only a slight hæmorrhage.

A laparotomy was performed, a median incision being made below the umbilicus. The catheter had penetrated the cæcum for about 5 cm. on the right side and was found surrounded by omental adhesions. The uterus did not show any scar. After the removal of the catheter and suture of the cæcum the omental mass was left undisturbed. The woman made a good recovery. On examination six months later it was found that the inflammatory omental mass had completely disappeared.

In the author's opinion the catheter did not rupture the uterus, but was pushed directly into the Douglas sac, where it became fixed and embedded in the omentum. Penetration of the cæcum occurred subsequently. The entrance of fæces into the peritoneum was prevented by the strong adhesions.

W. A. BRENNAN.



## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

**Albeck: The Vomiting of Pregnancy and Its Relation to the Thyroid Gland** (*Recherches sur les cas de vomissements dans la gestation en rapport avec la glande et la grandeur du corps thyroïde*). *Gynec. et obst.*, 1920, ii, 47.

Of 1,707 pregnant women questioned by the author, 1,157 stated that they had suffered from vomiting. In 358 cases the date at which the vomiting began after the last menstruation was known, the period varying from eight days up to the end of pregnancy. In the author's opinion this vomiting is not of nervous origin, although simple cases of vomiting may be aggravated by nervousness. Simple and uncontrollable vomiting and vomiting associated with icterus and neuritis are due to toxæmia of pregnancy.

Albeck has found a constant relation between the size and consistency of the thyroid gland and the intensity of the symptoms; women with large soft glands do not vomit during pregnancy while those with small hard glands always vomit. During pregnancy there is often an increase in the size of the gland. These statements are based on the examination of the thyroids of 1,581 women twenty-four hours after delivery.

W. A. BRENNAN.

**Hendry, R. A.: Pregnancy and Latent Syphilis: I. The Inter-Relationship between Pregnancy and Syphilis.** *Lancet*, 1920, cxcix, 986.

In the cases presented by the author the syphilis was latent in that there were no active clinical symptoms or signs of syphilis apart from the effect on pregnancy. These cases were collected from records covering the period from 1916 to 1920 in the ante-natal clinics in Liverpool.

Hendry divides his evidence into (1) clinical, and (2) laboratory. Clinical evidence consists of a history of infection and past obstetrical history. The laboratory evidence is divided into the Wassermann test and the examination of the foetus and placenta. The case reports are illustrated by a rather ingenious diagrammatic chart of abortions, stillbirths, deaths of new-born infants, later deaths, surviving children, and Wassermann reactions. The author relies for the most part on the Wassermann reaction and believes that a Wassermann reported positive in any degree justifies the institution of anti-specific treatment. Of 348 reactions, 173 were "positive" and 175 negative.

Treatment should be begun as early as possible; the best results are obtained in the cases of patients treated prior to pregnancy. Treatment with gray oil injections was abandoned in favor of hydrargyrum cum creta, 1 gr. three times a day by mouth. Arsenic compounds were not given.

The author feels that the following conclusions are justified:

1. The clinical evidence of syphilis is unreliable.
2. The Wassermann reaction is the test by which, at present, the diagnosis must usually be made. A negative or a slightly positive reaction may be obtained in syphilis during pregnancy, and a positive reaction may occur even in the case of a non-syphilitic person.
3. The examination of stillbirths, etc. furnishes reliable but, at present, insufficient evidence.
4. The institution of mercurial treatment before pregnancy justifies a favorable prognosis as regards the foetus.
5. When treatment is begun during the pregnancy the prognosis depends on the unknown and already present degree of infection of the foetus.

R. D. MUSSEY.

**Routh, A.: Pregnancy and Latent Syphilis: II. Spirillolysis and Its Causation.** *Lancet*, 1920, cxcix, 988.

The mature spirochæte is known to break up by spirillolysis into "granules," generally by transverse division. That these granules have the power to infect was proved by Noguchi at the Rockefeller Institute. Spirillolysis during pregnancy is caused by syncytial toxins (chorionic ferments) which develop very early and continue their action during pregnancy. These ferments are intended for trophoblastic purposes to facilitate the burrowing of the fertilized ovum into the uterine mucosa at the placental site. Their excessive action is in turn apparently controlled or neutralized by the so-called "syncytio-lysins" as the result of the trophoblastic action on the maternal tissues.

The syncytial toxins which remain in the maternal blood fifteen days postpartum also have the power of rendering the granules partially or wholly inactive, a fact which accounts for the previously unexplainable latency of syphilis during some pregnancies and the negative Wassermann reactions which become positive some weeks after delivery. Similarly the granules may be destroyed entirely in the foetus or only held in check. In the former instance, the child will show no evidence of syphilis but in the latter it may give a negative Wassermann reaction at birth and a positive reaction some weeks later.

The power sometimes possessed by the chorionic ferments to destroy the granules absolutely would bear out Colles' law which is founded on the fact that women infected before or during the course of their pregnancy cannot be re-infected.

Gibbs in 1917 stated that he had never known a positive reaction in a congenital syphilitic to become



negative after treatment. The treatment of syphilis in the pregnant woman, therefore, has two objects: to cure the mother and to prevent the child from being a congenital syphilitic. The author believes congenital syphilis may be prevented by proper facilities for diagnosis and efficient and sufficiently prolonged treatment of the mother and child.

R. D. MUSSEY.

**Adams, J.: Pregnancy and Latent Syphilis: III. Results of Three Years' Treatment of Syphilitic Mothers and Babies.** *Lancet*, 1920, cxcix, 990.

The author cites the cases of 95 mothers with syphilis who were treated during a three-year period. Most of the patients were treated first at the sixth month of pregnancy. In every case there was either clinical evidence of syphilis or a positive Wassermann reaction.

If the mother's Wassermann test can be brought to negative or doubtful at the time of her confinement, the baby will exhibit no signs of syphilis, but if the mother's reaction is positive or strongly positive, the baby's reaction will probably be positive also. None of the babies with negative reactions has since given a positive reaction or developed signs of syphilis.

If a pregnant woman with either active or latent syphilis is treated for three or four months before her confinement, she will probably be delivered of a healthy child at full term.

R. D. MUSSEY.

**Newell, F. S.: The Treatment of Pregnancy and Labor Complicated by Cardiac Disease.** *Am. J. Obst. & Gynec.*, 1920, i, 179.

The patient with cardiac disease who becomes pregnant must be regarded as a relatively unfavorable risk even under the best conditions. Before considering the methods to be adopted in the care of the individual case certain facts must be recognized if the patient is to be given the best chance for a favorable result:

First, whatever the nature of the cardiac lesion, the increased strain which pregnancy and labor unavoidably impose on the damaged heart must diminish the cardiac reserve to a certain extent and thus to a greater or less degree shorten the patient's life.

Second, it is impossible to estimate accurately the extent of the damage which will result to the heart from the strain of pregnancy, even under the best conditions, in spite of the most careful consideration of all the factors present in the individual case. There are no accurate means of determining the effect of the pregnancy on the heart and it is exceedingly difficult to formulate an accurate prognosis for the given case. As a rule, a patient otherwise in good health, without a history of previous decompensation and with presumably sound heart muscle may be advised that in all probability she may undergo pregnancy with an excellent chance of an immediately successful result if she remains under proper supervision, but that the strain on the heart will cause some damage which will ultimately short-

en her life, though to what extent it is impossible to predict accurately.

If a patient with mitral stenosis or aortic disease has never had symptoms referable to the heart (at least of a severe character), and the heart is performing its work properly when she comes for advice, such a patient should be placed on a definite routine to remove all possible strain from the heart and the pregnancy should be allowed to go on under close observation, interference being advisable only when symptoms develop.

If abortion seems indicated the method of operation is of considerable importance. Unless the patient's condition is such as to contra-indicate an abdominal operation an abdominal hysterotomy is best. Sterilization should be performed at the same time to obviate the danger of future abortion.

It is little more dangerous, if any, for a patient with a bad heart to be delivered in this way than to have the uterus emptied from below.

Cesarean section at term and earlier under local anæsthesia is the most satisfactory method for patients whose cardiac condition contra-indicates the use of a general anæsthetic.

In the cases of patients with mitral regurgitation which has never caused any symptoms the only precaution necessary is to prevent the strain of the second stage of labor by prompt delivery as soon as the cervix is fully dilated.

The same principles should be followed for patients who are believed to have myocardial change although no definite heart lesion can be demonstrated. The condition of the heart muscle is even more important than the presence of a valvular lesion, and in the cases of patients who are suffering from symptoms suggesting myocarditis, either acute or chronic, all possible strain should be taken from the heart. This is best accomplished by abdominal delivery at a fixed date.

E. L. CORNELL.

**Haag, M. D.: Report of a Case of Encephalitis Lethargica in a Pregnant Woman, with Autopsy Findings.** *J. Michigan State M. Soc.*, 1920, xix, 483.

The author's case occurred early in the year 1919 when very few cases of encephalitis lethargica had been reported in this country and was among the first in which the condition was a complication of pregnancy. On this account it presented numerous difficulties from the standpoint of diagnosis.

When the patient first began to complain of nausea and vomiting, the possibility of toxæmia of pregnancy was considered, but the urinary findings of toxæmia and jaundice were absent and the blood pressure was normal.

At no time throughout the entire course of the disease were there any signs which would indicate a threatened abortion in spite of the fact that the temperature rose as high as 104 degrees. The foetus remained alive until the day the patient died.

The occurrence of encephalitis lethargica as a complication of pregnancy is evidently infrequent.



Its mortality under such conditions is 63 per cent. The prognosis is most unfavorable when the temperature is high. The disease does not tend to cause the death of the fetus and it does not seem to predispose to abortion. Most patients with the disease, if they live sufficiently long, carry their babies to term and the labors are quite apt to be painless and associated with very little shock. Whether or not the pregnancy complicating the encephalitis has anything to do with the high mortality rate must be determined when a greater number of cases have been reported.

E. L. CORNELL.

**Maury, J. M.: Abdominal Pregnancy with Fetus Alive at the Time of Operation: With Résumé of Cases.** *Surg., Gynec. & Obst.*, 1920, xxxi, 523.

The author has collected from the literature the reports of 29 cases published between 1909 and 1918. The diagnosis was made before operation in 18 (62 per cent). It is pointed out that it is highly desirable that ectopic pregnancies be recognized and operated upon at the time of primary rupture as only in this way may the number of advanced abdominal pregnancies be reduced to a minimum. In the cases operated upon the maternal mortality was 24.6 per cent and in nearly every case the death was due to hæmorrhage, sepsis, or both. Of the children born alive, 45.7 per cent died within three or four days and 26.6 per cent were deformed, the deformity usually being some type of talipes due to pressure.

In 26.9 per cent of the cases there was a history of primary rupture. Considering the fact that primary abdominal pregnancy is rare and therefore that practically all cases must be due to tubal rupture or tubal abortion, it would seem that these figures are rather low, but when the number of cases undiagnosed or wrongly diagnosed at the time of primary rupture is borne in mind, they do not seem so far wrong. Large numbers of cases show evidence of toxæmia. In over 80 per cent pain was the most prominent symptom, and was associated with nausea and vomiting and followed by faintness and syncope. In nearly half of the cases there was irregular bleeding from the uterus.

In most cases the placenta was attached to the pelvic organs: the uterus, broad ligaments, tubes, pelvic wall, small intestines, and sigmoid. In 2 cases it was attached to the liver. In several it was attached by a pedicle and could be ligated in the same way as a pedicled ovarian cyst. The mortality was 10 per cent when the placenta was removed, and 40 per cent when it was left or removed only partially. From the histories given it would seem that the size of the uterus is variable, probably depending upon the attachments and blood supply of the placenta.

The treatment of cases so nearly normal that the condition is not recognized until after spurious labor with failure of delivery is immediate operation. Operation is indicated also in cases with constant pain, attacks of syncope, hæmorrhage, or toxæmia.

When the condition is recognized but the complaints are of minor importance and the woman would probably go on to term without serious mishap an operation is indicated in the interests of the mother if she is seen before seven and one-half months but if she is seen after that time, provided she can be kept under close observation, operation should be deferred until after the death of the child.

The advisability of removing the placenta must be decided by the operator on the requirements of the individual case. If it has a pedicle-like attachment the removal is simple. If it grows from organs which may be removed, it should not be separated from them but both should be removed *en masse*. The greatest difficulties are encountered in cases in which the placenta has developed on the liver or the mesentery or is adherent to the pelvic wall. These are cases which tax one's judgment in the decision for or against removal and one's ingenuity in controlling hæmorrhage.

C. H. DAVIS.

**Duehrssen, A.: Twenty-Five Years of Vaginal Cesarean Section (Fünf und zwanzig Jahre vaginaler Kaiserschnitt).** *Berl. klin. Wchnschr.*, 1920, lvii, 752.

While in 1895 Duehrssen recommended vaginal cæsarean section with only one anterior vaginal-uterine incision for premature delivery, he now recommends the double incision as the method of choice for delivery at term. Technically the double incision is more simple than the single incision and is not associated with such a severe hæmorrhage because it does not extend so high into the portions of the uterus which are rich in blood vessels. The posterior incision need be only 4 or 5 cm. in length and therefore opening of the Douglas can surely be avoided. The bleeding from the uterine incisions causes no serious difficulty, especially if the incisions are made quickly and the hand is inserted to perform version. The incisions are compressed until no more blood is present and bleeding therefore does not begin again until after the extraction of the child.

The author states that the Rissmann aortic compression apparatus and the Seht aortic clamp effect hæmostasis well but that he has no experience with them. If Crédé expression is unsuccessful, the placenta is separated manually. In atony of the uterus tamponade with iodoform gauze is employed, the tampon being removed in from ten to twenty-four hours.

Among the indications for the vaginal cæsarean section the author first mentions eclampsia for which condition he suggested the procedure in 1895 and still employs it today. This causal treatment — the interruption of the pregnancy as the cause of the toxæmia — the author considers ideal when it is associated with venesection. He recommends the vaginal cæsarean section also in cases of placenta prævia as an incision for the introduction of the metreurynter but only for cases in which, after the insertion of the metreurynter, the child's life would



be endangered and the bag would not be easily removed. In the cases of primiparæ with low position of the head and effaced cervix the author does not use the metreurynter incision. In such instances he splits the posterior cervical edge as far as the position of the head will permit, then divides the anterior edge, extending the incision about 2 cm. to the anterior vaginal wall, pushes the bladder up, and divides the exposed cervix about 2 cm. further. Forceps extraction completes the delivery. For the closure of the vaginal and uterine incision one suture is sufficient. Duehrssen does not recommend the vaginal cæsarean section in cases of miscarriage as much simpler methods usually suffice. Gestation encephalitis with fever, loss of consciousness, and cataleptic phenomena is a new indication advanced for the operation.

According to the author there are definite and safe extraperitoneal methods in which, by the vaginal route alone or combined with a flank incision, delivery of a living child can be effected without preliminary labor pains. CREITE (Z).

**Kickham, C. J.: Ruptured Uterus in a Previously Cæsareanized Patient; with the Report of a Case Where the Fœtus Remained Intact within the Membranes Following Rupture.** *Boston M. & S. J.*, 1920, clxxxiii, 602.

The author reports a case of rupture of the uterus occurring in a para-iii aged 27. The patient's family history was negative. In May, 1917, a cæsarean section was performed for eclampsia and a dead baby was delivered. In June, 1918, a living baby was delivered by a second cæsarean section. Both of the operations were done at a private hospital and were followed by a normal convalescence.

The patient came under observation when about four months pregnant. Frequent examinations showed all functions to be normal and the abdominal scar to be in good condition. The uterine scar felt firm. During the progress of pregnancy the abdomen enlarged normally and without abnormal symptoms.

About four hours previous to the operation the patient had eaten a hearty meal, including several hot biscuits. Occasionally these had caused vomiting and therefore when about half an hour later she had a cramp in the lower abdomen and vomited, she assumed it was due to this meal. The author saw her one-half hour later. At that time she was not suffering great pain, complaining only of a "severe cramp." Vomiting, which occurred once, was associated with a feeling of "irritation" over the whole lower half of the abdomen and a constant desire to urinate.

At examination, the patient looked well and was laughing. Her color was excellent, her pulse 75, of good quality and regular, and her temperature 98.4 degrees F. The uterus could apparently be made out but not with a degree of certainty consistent with normal conditions. The uterine wall seemed lax and yet this wall seemed to enclose the fœtus. The fœtus itself could be palpated with

more than usual ease but not more so than in many cases in which the patient had had repeated pregnancies. It was not very freely movable and when pushed to one side or the other returned as in normal abdominal ballotment. No fetal heart tones were heard but the patient said she felt movements. There was no vaginal discharge.

A median abdominal incision was made following the line of the previous skin scar. On opening the peritoneum fresh blood welled out of the wound. Exploration showed the fœtus still within its intact membranes and the placenta free in the abdominal cavity. The fœtus was delivered through the abdominal wound before the membranes ruptured. The uterus was found contracted down into the pelvis to about the size of a large grapefruit and showed a triangular rent on its anterior wall. The broad ligaments and vessels were ligated in the usual manner and a supravaginal hysterectomy was done. A drain was inserted into the pelvis and the peritoneum and abdominal wall were closed in layers around it. In all, about 10 oz. of fresh blood were free in the abdominal cavity.

The patient made an uneventful recovery as far as the abdominal condition went, but on the fourth day developed a phlebitis of the left leg which became very marked and caused much pain and a septic temperature. She was discharged at the end of three weeks in good condition. The baby weighed 4 lb., 7 oz.

In general the rupture followed the site of the scar of the previous operation on the right side. This old scar measured 9 cm. in length. The second scar was about 2 cm. to the left of the first one. The placental site was in the fundus, the area involved by the greater part of the rupture. The thickness of the uterine wall was between 2 and 3 cm. except at the site of rupture where it was between .5 and .7 cm.

E. L. CORNELL.

#### LABOR AND ITS COMPLICATIONS

**Demelin, L.: The Muscles Involved in Parturition and Their Insufficiency at the Time of Delivery** (*Les muscles parturients et les divers modes de leur insuffisance au moment du travail*). *Rev. franç. de gynéc. et d'obst.*, 1920, xv, 290.

Insufficiency of the muscles involved in parturition is habitually described by the term "inertia" and as "primary" or "secondary" according to the degree of advancement of the labor. In some cases, however, the condition is due to lack of muscular tone, while in others its cause is insufficiency of the uterine contractions. Inertia always expresses insufficiency or arrest of contraction.

Efficacious action of the uterus is dependent upon the difference between the intensity of the contractions and the tonicity in the uterus in the intervals between the contractions. That is, it depends upon the excess of the vigor of contraction over the tonicity.

In the first period of labor inertia is called primary and results from: (1) insufficiency of excitation of



the uterine muscle; (2) insufficiency of excitability of the muscle; or (3) a transitory or definite functional impotence dependent upon some anatomical or biochemical state of the contractile fibers.

Among the causes responsible for insufficiency of muscular excitation may be cited abnormal adhesion of the inferior pole of the ovum to the internal orifice, agglutination of the external orifice of the cervix, and elevation of the foetal part so that it is distant from the internal orifice and the inferior segment.

Among the circumstances in which the excitability of the uterine muscle fails are artificial and prematurely invoked labor in a primipara and the "tedious" labor of well-formed primiparae, the older the woman the greater the danger of serious complications.

Primary inertia affects principally the time of dilatation and has little relation to hæmorrhage. Except in complicated cases it demands only patience and care of the membranes. Secondary inertia is quite different. Dilatation is effected without delay, but there is some obstacle to expulsion and when this obstacle is situated high there is risk of uterine rupture. When the presentation has already engaged the pelvis, exhaustion follows an exaggerated effort and hæmorrhage may result. One variety of this type of inertia is due to weakness of the abdominal girdle, and in such cases the application of a band, uterine expression, the use of the forceps, and the administration of oxytocics such as hypophyseal extract are indicated. W. A. BRENNAN.

**Davis, E. P.: The Complete Forceps Operation.** *N. York M. J.*, 1920, cxii, 756.

If the histories of patients who had had bad deliveries followed by worse recovery, usually in private practice, were analyzed it would be found that in many cases the circumstances were essentially as follows:

The mother failed to deliver herself and assistance was required. With the help of a trained nurse only or possibly without such assistance, the attending physician anesthetized the patient and delivered her by forceps. There was more or less laceration, for which an attempt at repair was made. The child was injured somewhat, but apparently no permanent results followed these injuries. Convalescence was prolonged and, while the mother nursed her child, her recovery was not complete. Some time afterward it was found that there had been a considerable tear of the cervix which had not completely healed, and that the repair of the pelvic floor and perineum had not been entirely successful. A secondary operation was therefore necessary and between one and two years passed before the woman even approached her previous health. In other cases there is the distinct history of postpartum hæmorrhage after such delivery, or of well-defined puerperal septic infection.

The poor result was due to two factors. One was delay in delivery; the other, inadequate appliances;

insufficient assistance, and an incomplete and non-surgical operation. The circumstances were such that an aseptic technique was impossible.

In his discussion of the measures by which better results may be obtained the author states that most important in all discussions relative to obstetrical practice is the question as to whether obstetrics should be put on the same professional level as surgical practice. When cases of abnormal labor are treated in hospitals or the obstetrician takes to the private house the equipment necessary for good work, then and then only will there be substantial improvement. In suggesting what can be done in this matter, Davis advances no theory.

It is most important that signs of approaching exhaustion be detected by the nurse and the physician before the patient reaches a point where haste may be necessary. Medical teaching should emphasize this fact.

A thorough examination of each patient and a careful and complete history will show the shape and size of the birth canal, the strength and development of the mother, and the approximate size of the child. The forceps delivery is never attempted unless the head is well engaged and the birth canal dilated or practically dilatable. In operating in private houses matters of aseptic technique can readily be managed. It is especially important that a competent anesthetist and an additional nurse be at hand. Ether-oxygen is the anæsthetic of choice.

Attention is directed by the author also toward measures necessary after the delivery of the child. Sufficient time should elapse after the birth before an attempt is made to deliver the placenta. The uterus having been emptied, strychnine and aseptic ergot should be given by hypodermic injection. The uterus should be irrigated with 1 per cent lysol solution and thoroughly packed with 10 per cent iodoform gauze. Following the introduction of the gauze, the cervix should be drawn down by tenaculum forceps and inspected. If it has been torn, the lacerations should be closed with No. 2 chromicized catgut. The cervix should then be released, the uterus carried forward in the pelvic cavity, and the cervix pressed backward by aseptic gauze packed in the upper vagina. The uterus should be guarded by the hand of the anesthetist. The pelvic floor and perineum should then be inspected and any lacerations closed. After this the gauze should be removed from the vagina and a vaginal douche of 1 per cent lysol given. A strip of bichloride gauze should then be tied to the end of the iodoform gauze within the uterus, the cervix carried backward, and the uterus put in normal position by this moderate vaginal packing of bichloride gauze. A very practical question would indicate that such a procedure might be followed by septic infection. The author's experience and that of others, however, has shown that this is not the case.

In the after-treatment the gauze should be removed in from thirty-six to forty-eight hours. If



the upper gauze is dry and clean on removal, it is unnecessary to irrigate the uterus. After the operation tonic doses of strychnine to which some form of digitalis may be added, if needed, should be given. Under this method pain after delivery is rare. External stitches should be removed in from seven to ten days. Internal catgut stitches are absorbed.

### NEW-BORN

**Bailey, H.: Cranial and Intracranial Birth Injuries.**  
*Am. J. Obst. & Gynec.*, 1920, i, 52.

The author calls attention to the fact that a considerable number of stillbirths and early deaths are due to injury to the infant's head and suggests that proper treatment might lessen the early death rate in some degree and lower the morbidity among the infants which survive.

In his discussion of the historical aspect on the subject Bailey mentions the article written by Little in 1861, in which the relation of cerebral hæmorrhage to paraplegias and idiocy was first made clear.

The first decompression operation on a new-born infant was performed in 1877 and reported by Boissard. This was done for fracture of the parietal bone followed by symptoms of intracranial pressure. The result was successful. Cushing in 1905 advocated the adoption of the same principles of treatment in the cerebral bleeding of the new-born as in that of the adult. He reported four cases so treated, in two of which recovery resulted.

Tweedy in 1908 reported that in cases of spoon-shaped depression in the frontal and parietal regions he made an incision over the dent in the skull, bored

a hole through the bone with a volsellum forceps, inserted the sharp end of the forceps, and pulled the bone up.

In many cases there are hæmorrhages in other parts of the body besides the brain, and death results from a condition identical with that known in the first week as "hæmorrhage of the new-born."

Hæmorrhages occurring in the small and premature infant may be due to the fact that the poorly developed cranial bones easily overlap and thus cut the veins leading to the longitudinal or lateral sinuses or injure the sinuses themselves. In cases of parietal bone presentation in which great pressure has been exerted the small spoon-shaped depression in the bone is very common.

Fracture of the skull producing hæmorrhage usually means the rupture of a meningeal vessel. The bleeding from the surface of the cortex is often held beneath the pia and if it is located near the cortical centers may cause considerable damage even when it is slight. Hæmorrhage into the ventricles may occur from rupture of the choroid plexus and occasionally is not associated with bleeding elsewhere in the brain.

The author reports 5 cases and gives pictures of one of the patients at different stages following an operation and a table in which 40 cases of cerebral hæmorrhage are classified. He concludes that the results of decompression operations of the large osteoplastic flap type are not good, and that opening the coronal suture and inserting a drain is but little better. It seems that any method of resuscitation which notably increases the pressure in the cerebral veins should be discontinued. Mechanical respiratory apparatus to deliver air and withdraw the carbon dioxide must be perfected. C. H. DAVIS.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

Cadwallader, J. M., and Brown, A. A.: **Movable Kidney with Unilateral Nephritis: A Report of Two Cases Cured by Operation.** *J. Am. M. Ass.*, 1920, lxxv, 1252.

The authors recognize four degrees of renal mobility: (1) that in which only the lower pole is perceptible to the touch — frequently referred to as "palpable kidney"; (2) that in which the greater part of the body, but not the upper pole, may be palpated; (3) that in which, besides the findings of the second variety, the upper pole may be distinctly outlined; and (4) that in which the entire kidney is palpable and may be freely displaced in the abdomen or the pelvis — the so-called "floating kidney."

In the first case reported the postoperative course was comparatively smooth. The patient remained in bed for one month, the urine at this time showing a few casts but no albumin or other abnormal constituents. One month later the patient was in good health and the urine was normal.

In the second case absolute bed rest for six weeks was insisted upon. During this period the urine became normal and the general condition improved decidedly. Three months later the patient was comparatively comfortable and the urine remained normal.

In commenting on these cases the authors state that while mere mobility of the kidney may be a negligible condition, it may also be the cause of serious organic trouble; that not every neurotic with a movable kidney is to be passed by or treated merely for his neurosis; and above all else, that every patient with a movable kidney and urine indicating nephritis should be subjected to ureteral catheterization for the separate study of the function and excretion of each kidney. Chronic unilateral nephritis due to mobility of the kidney is curable.

LOUIS GROSS.

Cecil, A. B.: **Abdominal Pain in Diseases of the Kidney and Ureter.** *J. Am. M. Ass.*, 1920, lxxv, 1239.

Cecil's study is based on a critical review of 300 cases in which a complete urological examination of the upper urinary tract was made in order to determine the frequency and distribution of abdominal pain in association with diseases of the kidney and ureter.

The classical picture of pain beginning in the region of the superior lumbar triangle, radiating to the lower abdomen, the genitalia, or thigh, is undoubtedly the most typical picture of renal pain, but is often absent. In fact, the pain is often abdominal in type and not associated with pain in the back.

These cases were classified into twelve main groups namely, stone in the kidney and ureter, renal tuberculosis, pyelonephritis, hydronephrosis, nephroptosis, pyonephritis, chronic nephritis, congenital malformations of the kidney, tumor of the kidney, polycystic kidney, cystitis, and a miscellaneous group comprising cases of essential hæmaturia, cases studied for differential diagnosis, various rare conditions, and those in which the findings were negative.

The group of stone comprised 67 cases. Tables were made as to age, the duration of symptoms, the histories of cases in which various operations had been performed, and the histories of those in which an erroneous diagnosis had been made but an operation had not been performed. A detailed study showed that the position of the stone, whether in the kidney or in the ureter, had little bearing on the distribution of the pain. A stone in the lower portion of the ureter may give symptoms of pain in the renal region of the back or high up in the abdomen, while a stone in the kidney may give pain which is limited to the lower abdomen or the testicle. This fact has a bearing on the absolute necessity of covering the entire abdomen in roentgenological examinations.

In Group 2 were 40 cases of renal tuberculosis. In this group the pain was found to be of an entirely different type from that in cases of hydronephrosis or stone. It was more of an aching in the region of the back, and when localized in the abdomen was spoken of as a burning sensation. In the epigastrium it was usually a sickening sensation, but in none of the cases was it of an acute type.

In Group 3 were 77 cases of pyelonephritis. In this condition as in renal tuberculosis abdominal pain was less severe, but had been one of the principal factors leading to unnecessary abdominal operations.

In Group 4 there were 26 cases of hydronephrosis and hydro-ureter. With the exception of 6 cases which had been operated upon for stone associated with hydronephrosis, abdominal operations were performed on 30 per cent of the remaining cases for the relief of pain which was subsequently demonstrated to have been of renal origin. The symptoms of hydronephrosis are often obscure and misleading, and it is in this group of cases that the urine is so often practically normal.

The author claims that although it is impossible to carry out urological examinations as a routine procedure, there are certain indications for such examinations. Abdominal pain is not one of them but is by no means a contra-indication and becomes a definite indication when the urine is abnormal.

LOUIS GROSS.



**Braasch, W. F.: Occluded Renal Tuberculosis.** *J. Am. M. Ass.*, 1920, lxxv, 1307.

Renal occlusion results from various conditions, the most common of which is stricture of the ureter in renal tuberculosis. In 69 of 621 patients operated on at the Mayo Clinic for renal tuberculosis the affected kidney was found to be occluded. In most cases renal occlusion occurs gradually or is intermittent for some time preceding the final permanent occlusion. The state of the bladder often reflects the degree of occlusion. When the occlusion is only partial, sufficient infectious material leaks into the bladder to perpetuate a localized or total cystitis of variable degree. This condition is most common in male adults in the fourth and fifth decades.

Frequency, one of the most prominent symptoms, is found in only 56 per cent of cases of occluded tuberculosis in contrast to 90 per cent, its usual incidence in renal tuberculosis. One-third of the patients complained of pain. In most cases this was merely a dull ache, although in a few acute colic developed at the time of occlusion. In the 24 cases with hæmaturia pain was the chief complaint in only 6. The discovery of the condition was accidental in 6 cases.

The duration of symptoms in most cases was much longer than the average for renal tuberculosis, varying from one to twenty years. Since acute symptoms subside after occlusion, medical advice is generally not sought until very late.

Pus and red blood cells, usually in moderate amounts, were found in all but 8 cases. Excluding cases of bilateral disease, the tuberculosis bacillus was found in 9 instances. X-ray examinations revealed a tuberculous kidney in 30 per cent of the cases, a figure that is considerably higher than that of the average renal tuberculosis.

The bladder was practically normal in 33 per cent of the 69 cases of renal occlusion and there was only slight cystitis in 33 others, so that in 88 per cent the bladder was but little involved. In making a diagnosis of unilateral occlusion it is necessary to remember that, because of a transient or reflex suspension of function, a false diagnosis of occlusion is possible. Correct pre-operative diagnosis was made in 64 per cent of the cases. In practically all of the cases seen during the last five years the condition has been recognized clinically prior to operation. Nephrectomy is very easily carried out if the occlusion is of long standing. Recently occluded, large pyonephrotic kidneys may be difficult to remove. In 34 of these cases the wound healed by first intention.

The operative mortality was 1.6 per cent. Excluding patients with bilateral tuberculosis, all but one of whom are dead, 8 have died. Marked improvement in the general condition was noted in 67 per cent. Of those patients who complained of bladder symptoms improvement was noted in all but 9 (18 per cent).

Emulsions from the substance of 5 occluded tuberculous kidneys were injected into guinea pigs. In 1

case the guinea pig died two months after the inoculation with evidence of diffuse tuberculosis. The other 4 inoculations were unproductive. The author concludes that if the kidney has been dormant for many years little good will be derived from a nephrectomy unless there are definite symptoms referable to the kidney. A. J. SCHOLL, JR.

**Young, E. L., Jr.: Renal Hæmaturia as a Symptom of a Prenephritic Condition of the Kidneys.** *Surg., Gynec. & Obst.*, 1920, xxxi, 478.

The author attempts to prove that so-called "idiopathic hæmaturia" is a symptom of a pre-nephritic condition of the kidney. In 33 cases studied there were 7 in which a definite pathologic lesion, such as a movable kidney, horseshoe kidney, traumatic lesion, and a very small stone, accounted for the hæmorrhage. The author discusses focal infectious nephritis and describes a specimen obtained from a case in which this lesion was the cause of hæmaturia. The point is made that the finding of organisms in the urine does not signify infection of the kidney as the kidney may excrete organisms without becoming infected.

The practical value of the study is summed up in the following paragraphs:

"The precancerous stage has now been talked about for some time, and the treatment of those lesions known to be the occasional forerunners of cancer holds a recognized place in therapeutics. I believe that hæmaturia may be a symptom of sufficient importance to attract attention, due to a stage in kidney disease where the damage is very slight and where a cure and restoration of the renal tissue to normal may confidently be expected if the primary site of trouble can be recognized and eliminated.

"I realize that I have not proved my point as well as I wish, and even if I had, that the number of cases of hæmaturia from a pre-nephritic condition in comparison with all the cases of nephritis is so small as to result in very little actual progress in curing the disease; but what I hope is, that the recognition of this possibility may be another step toward the goal of preventive medicine.

"It is reasonable to believe that in a majority of these cases there is an early unrecognized nephritis or a pre-nephritic condition which can be, and probably often is, the cause of hæmaturia, and that this condition may or may not go on to a progressive damage of the kidney, depending on conditions which we do not as yet understand. In certain of these cases the primary focus of damage can be recognized, and its elimination will prevent the later development of the disease." V. D. LESPINASSE.

**Kretschmer, H. L., and Helmholz, H. F.: The Treatment of Pyelitis in Infancy and Childhood.** *J. Am. M. Ass.*, 1920, lxxv, 1303.

The authors report the results of treatment by pelvic lavage with silver nitrate in 11 cases of pyelitis in infants and children.



Cystoscopy can be performed in infants as easily as in adults. The authors quote Nitze and Hyman on cystoscopy and ureteral catheterization in children. In boys, because of anatomical considerations, cystoscopy and ureteral catheterization cannot be carried out as easily as in girls. The authors performed cystoscopy repeatedly, however, on boy babies 14 months of age.

The value of a routine roentgen-ray examination cannot be over-emphasized. In this way several cases of so-called pyelitis were proved to be cases of stone in the pelvis with infection. Doubtless in some of the cases diagnosed as pyelitis in which pelvic lavage fails to produce a cure the failure is due to the presence of calculi, tuberculosis of the kidney, or stricture of the ureter.

In order that renal tuberculosis might not be overlooked, routine examinations for tubercle bacilli were made, including guinea-pig inoculations with urine obtained from each kidney and bladder. In this series no evidence of renal tuberculosis was found.

The youngest patient treated was 7 months of age; the oldest, 10½ years old. All of them were girls.

There were no untoward results or reactions following instrumentation and treatment.

It was the object in treating this series of cases to render the urine free from pus and sterile. In other words, no case was considered as cured in which these requirements were not fulfilled. Symptomatic cures were not considered.

In 9 of the 11 cases complete cures were obtained; that is, at the time the patients were discharged as cured the urine was free from pus and the cultures were sterile.

The cultures were reported sterile if no growths were found at the end of forty-eight hours. In order that the possible presence of slow-growing organisms might not be overlooked, however, the plates were kept in the incubator for five days before a final report was given. Accordingly it may be stated that in every case in which specimens were obtained the cultures remained sterile at the end of the fifth day of incubation.

Silver nitrate solution was used in each case. The strength of the solution used was 0.5 per cent. The amount injected varied from 1 c.cm. in the cases of infants to 5 c.cm. in the cases of older children.

The number of injections necessary to render the urine sterile varied. Three patients required but one injection, 5 required two injections, and 1 required three.

In 2 cases the urine from the kidney became sterile before that of the bladder, in one case after two injections and in the other after the first injection. The latter was a case of bacillus paratyphosus infection. A subsequent examination one week later demonstrated that the kidneys were again infected. In treating adults this observation had been made several times. In some of the cases in which it was noted there were recurrences of the pyelitis.

The fact therefore seems to be of sufficient importance to warrant emphasis for if the kidneys show sterile specimens and the bladder still harbors infection, the bladder may be a cause of subsequent recurrence. In an article on cystography by Kretschmer it was shown that fluid may regurgitate from the bladder up the ureter into the kidney pelvis. This phenomenon was noted in infants and children as well as in adults in a series of cases of both normal and pathologic bladders.

Two cases in the author's series showed regurgitation of bladder fluid into the renal pelvis.

In 10 of the 11 cases the colon bacillus was found in pure culture. One patient had a paratyphoid bacillus infection.

In all of the cases the pyelitis was bilateral.

Routine leucocyte counts were made on each specimen of urine. This method gives a more accurate estimation of the amount of pus present in the urine than the indefinite terms now in use.

The article is summarized as follows:

1. Pelvic lavage with solutions of silver nitrate is a procedure which may be carried out in the cases of infants and children.
2. This mode of treatment has rendered the urine sterile and free from pus in 9 of 11 cases.
3. There have been no complications or unfavorable results following this treatment.
4. All of the cases treated in this manner had resisted all other forms of treatment.

For a complete record of the leucocyte count and cultures the reader is referred to the original article.

THEODORE DROZDOWITZ.

**Taddei, D.: Chronic Unilateral Pyelonephritis Associated with Haematuria and Pain** (*Le piolonefriti croniche unilaterali ematuriche e dolorose*). *Arch. ital. di chir.*, 1920, ii, 387.

In 1913 Taddei published a study of chronic painful unilateral nephritis but was unable to arrive at any definite conclusions regarding the etiology of the condition. Recent literature has added little to the solution of the problem. In this article Taddei gives the clinical histories of 6 cases of his own which he believes throw further light on the subject as some of them presented lesions which to date have rarely been taken into consideration or at least have been interpreted erroneously.

Taddei draws the following conclusions from the study of his cases:

1. In order to study the pathogenesis of renal nephralgia and haematuria of unknown origin, an examination of the calices, the kidney pelvis, and the ureter is necessary. The macroscopic examination of the kidney or a biopsy made on the occasion of a nephrotomy is insufficient.
2. The causation of the pain cannot be attributed to perinephritis or to alterations of the capsule of the kidney.
3. The nephralgias and the so-called "essential haematurias" are related to a nephritic process which is often unilateral, but in the former, lesions



of parenchymatous or chronic epithelial nephritis prevail, while in the latter the lesions are glomerular, interstitial, and vascular.

4. Nephritis of this type is associated with pyelitis and therefore should be termed "pyelonephritis."

5. The pyelitis may assume the various histologic aspects of chronic pyelitis, viz., simple, granular or follicular, papillary, villous, proliferating, pseudoglandular, and cystic pyelitis.

6. The pyelitis should be considered as secondary to the nephritis. The form of pyelitis is not specific in relation to the renal process; that is to say, there may be pyelitis of the same type in the painful and hæmaturic nephritis and in other renal lesions, hæmaturic, suppurative, or otherwise.

7. The hæmaturia ought not to be considered due to the pyelitis, but rather as due to the nephritis and particularly to glomerulitis and renal arteritis.

8. Even if many findings suggest that the cause is a toxi-infection and that the kidney is attacked primarily by the blood route, the nature of such a cause is still unknown. Tuberculosis, syphilis, and other infective processes may be responsible in certain cases, but in others can be excluded. The same is true regarding other conditions.

In Taddei's opinion there are no positive data on which a direct diagnosis of painful or hæmaturic unilateral pyelonephritis can be based. Such a diagnosis can be established only by exclusion.

With regard to treatment the author recommends nephrectomy when the surgeon is absolutely sure that the affection is unilateral. When he is not certain, nephrolysis, nephrocapsectomy, or nephrotomy may be done.

Nephrectomy in Taddei's 6 cases resulted in definite recoveries, the patients still remaining well after six or seven years.

W. A. BRENNAN.

**André: Eight Cases of Ureteral Calculi or of Calculous Anuria Successfully Treated by Ureteral Catheterization** (Huit cas de calculs de l'uretère ou d'anurie calculeuse traités avec succès par le cathétérisme urétéral). *J. d'urolog. méd. et chir.*, 1920, x, 89.

André gives 8 clinical histories to show that repeated catheterization or catheterization with a permanent catheter is a very efficacious method of removing a ureteral calculus, especially if it is small and situated low. In some cases also larger calculi, even those situated high, may be extracted in this manner. Ordinary sounds give as good results as sounds of special design.

In cases of calculus without urgent complications treatment may be limited to repeated catheterization, but if the sound can clear the obstacle it is better to allow it to remain in place for a day or two to dilate the ureter. If the obstacle cannot be passed the attempts at catheterization will often move the stone slightly and place it in a position more favorable to expulsion. When the stone can

be passed with the sound the injection of oil or glycerine above it is of value. The author has not used such injections, but when he was able to pass the sound into the kidney pelvis he has given a silver-nitrate lavage which, in addition to its antiseptic action, relaxes the ureteral contractions.

In calculous anuria, ureteral catheterization should be begun as early as possible, and if possible, should be bilateral. If the obstacle can be cleared, a permanent sound will safeguard the kidney and, when the urine is infected, will permit lavage with silver nitrate and disinfection of the renal cavities. In such cases the cessation of the anuria and the improvement in the patient's general condition make a surgical operation possible in case the calculus is not spontaneously eliminated.

If the sound cannot be passed the attempts to remove the calculus should be repeated several times before an operation is attempted. It should be remembered that even apparently unsuccessful endoscopic manoeuvres may be followed by the re-establishment of urination and expulsion of the stone.

Recurrences in calculous anuria are frequent. This may be due to the fact that often the calculi are multiple and the endoscopic removal is incomplete. Recurrences may be prevented by repeating the endoscopic manoeuvres at intervals.

W. A. BRENNAN.

## BLADDER, URETHRA, AND PENIS

**Schramm, C.: Theoretical and Practical Considerations Regarding the Cystoscopic Examination of the Paralyzed Bladder** (Theoretische und praktische Erwägungen zur Spiegeluntersuchung der paretischen Blase). *Ztschr. f. Urol.*, 1920, xiv, 329.

The author endeavored to determine whether there are any objective symptoms in paresis of the bladder by which incontinence of urine due to this condition could be distinguished from malingering. Quite often in industrial plants patients with spinal injury are discharged from the hospital without serious urinary symptoms and with suitable compensation, but when the compensation is stopped or reduced, complaint is suddenly made of subjective symptoms such as urinary incontinence, dripping of urine, etc.

The author has been able to demonstrate paresis of the bladder cystoscopically. In positive cases the muscle edge, which normally would prevent a view into the pars prostatica, gaps so that from the floor of the bladder the posterior urethra and contents as far as the external sphincter muscle can be seen clearly. The anterior wall of the urethra is obstructed, of course, by the shaft of the cystoscope. The picture described varies according to the severity of the paralysis. Characteristic of these cases is the fact that the introduction of the cystoscope is met by slight or no resistance on the part of the sphincter and the instrument can be moved about freely in all directions.



The anatomical basis for this laxity lies in the fact that the causal paralysis affects the pelvic musculature as well as the bladder. As a result of the paralysis of the pelvic floor the abdominal pressure acts caudalward; the anterior wall of the urethra is fixed immovably to the lower border of the symphysis by intimate adhesions to the pelvic fascia and the urogenital trigone, while the posterior wall of the bladder and urethra bulges out. Trabeculae are found chiefly in the region of the bladder trigone. These cannot be considered actively hypertrophic as in other disturbances due to obstruction. In the parietic bladder there is no obstruction. According to Schramm, the trabeculae are rests of powerful muscle bundles which have resisted the dilatation due to the urine accumulated in the bladder, whereas the weaker bundles of the bladder wall have become atrophied and bulge out like diverticula.

Following the cystoscopic examination the author tests the bladder functionally. With the patient lying down it is filled with from 300 to 500 c.cm. of irrigating solution in such a manner that the patient is not aware of it. After the removal of the catheter the patient's muscle and tendon reflexes are tested to divert his attention for a while and he is then requested to cough, press down, and to rise without using his hands. If the bladder remains closed under these exercises a functional disturbance can be excluded.

The author gives in detail the histories of 6 cases in some of which the bladder affection was due to trauma and in others to a chronic disease of the cord (tabes, multiple sclerosis). In tabes the progress of the condition can be checked by treatment with salvarsan and mercury.

In conclusion the author reports on the cystoscopic examination of the prostatic cavity after prostatectomy. Occasionally by this means the cause of postoperative disturbances (stone, fistula, etc.) can be determined. POSNER (Z).

**Fowler, H. A.: Ulcer of the Bladder (Hunner Type).** *J. Am. M. Ass.*, 1920, lxxv, 1480.

The author calls attention to the fact that irritability of the bladder is due to a variety of causes, intra- and extravescical. There is a considerable group of cases, however, for which no adequate cause for the symptoms can be demonstrated. These have been conveniently grouped together under the diagnosis of neurosis or neuralgia of the bladder.

As a result of more recent investigation this group of so-called bladder neuroses has been gradually broken up as the causative factor has been demonstrated in one small group after another. A definite pathologic basis for the symptoms has been demonstrated in an increasing number of cases, and successful treatment for the condition has been established.

As a result of Hunner's work we now know that in one such group the symptoms are due to a peculiar type of bladder ulcer. This lesion was first

described by Hunner in 1914, and again in 1918. In 1919 Reed reported five cases. The most recent contribution to the subject will be found in the *Annals of Surgery* for April, 1920.

The symptoms associated with this form of ulcer are those of an intensely acute cystitis—pain, frequency, urgency, and tenesmus. The suffering is extreme, and the victims rapidly become nervous wrecks. While the symptoms suggest acute cystitis, routine examination of the urine fails to reveal the usual signs of this condition. The urine is macroscopically clear and free from infection. Cystoscopy shows a small circumscribed area of inflammation on the anterior wall of the bladder in the center of which is a small superficial ulcer. These lesions are so slight as to be readily overlooked, or, if seen, considered insufficient to cause the severe symptoms of which complaint is made. However, while the lesion of the mucous membrane is slight as viewed through the cystoscope, in reality all the coats of the bladder are involved in an extensive chronic inflammatory process. The cystoscopic appearance is therefore misleading as to the extent and nature of the condition.

The diagnosis is based upon the history of the case, the negative urinary changes, and the cystoscopic findings. The only condition apt to cause confusion is chronic granular urethritis in women.

The treatment consists in excision of the ulcer-bearing area with a wide margin of normal bladder wall. Local treatment gives only temporary relief; it never cures. Three cases are reported, two of which were operated upon with brilliant results.

**Judd, E. S., and Sistrunk, W. E.: The Surgical Treatment of Malignant Tumors of the Bladder: Results of Operations.** *J. Am. M. Ass.*, 1920, lxxv, 1401.

The greatest danger and difficulty in radical surgery of the bladder is infection of the field of operation. The segment of bladder is removed from an area which lies in a dependent pocket from which it is difficult to establish satisfactory drainage. It is therefore imperative that the technique be carried out as accurately as possible. This necessitates large incisions with free exposure and ample protection of the involved tissue.

Malignant tumors of the bladder are usually either papillary epitheliomata or carcinomata. Papillary tumors may be either benign or malignant. It is always advisable to make a microscopic examination of a section of the tumor as the type of papilloma is very important in determining the treatment. Satisfactory results may be obtained with fulguration in cases of benign papillomata, while malignant tumors should be excised. If the tumor is small and there is doubt as to its malignancy, it is best to try fulguration as long as improvement takes place. The growth should be observed carefully during this treatment, however, and if it progresses, fulguration should be stopped and excision performed early.



Carcinomatous tumors of the bladder are of two types: (1) the superficial ulcerating growth which is slow growing and slow to metastasize, and (2) the large, hard ulcerated carcinoma which penetrates the perivesical adipose tissue and is also slow to metastasize.

Early perivesical involvement before there is evidence of metastasis was a striking feature in the series of cases reviewed. If some method were devised to reduce the local recurrence, the results would be better than those obtained by operation for cancer in other regions.

Usually operation is contra-indicated when there is remote metastasis and when the growth is attached to the rectum or involves the base of the bladder, the prostate, and the seminal vesicles. In selected cases, however, it seems best to remove the entire bladder.

About 90 per cent of all tumors of the bladder originate close to the ureteral meatus. Frequently the meatus is involved and the ureter is partially or completely blocked. When it is necessary to remove the meatus and a portion of the ureter, the ureter should be re-implanted into another portion of the bladder if the kidney function remains, or ligated and dropped back if the kidney is functionless.

Patients should be followed closely during the first two years after operation and should be re-examined at the first suggestion of further recurrence. If a recurrence is present treatment by repeated fulguration should be given.

The results obtained with the use of the knife and the cutting cautery are apparently the same. The good results obtained with the Percy cautery in cases of non-removable tumor indicate that it should be used more often than it is. One of the authors' patients remained well as long as six years after treatment with the Percy cautery.

The hospital mortality in the authors' 202 cases was 12.9 per cent. Thirty-four of the series were explored and found inoperable. Some of these were treated later by X-ray and radium and a number were benefited. Such treatment, however, was not applied in the effective manner in which it is given today.

If it can be shown that radium has the same favorable effect on epithelioma of the bladder as on the cervix, it will be best to perform a suprapubic cystostomy to afford drainage relief from infection and to place the radium in direct contact with the epithelioma. One argument against the use of radium and fulguration is that both may be employed when a radical operation should be performed. Radium should be reserved for inoperable malignant tumors and fulguration for definitely benign tumors. If the radical operation is performed in suitable cases the immediate and ultimate results should be very good.

C. F. ANDREWS.

**Wolbarst, A. L.:** *The Diagnosis of Inflammations of the Male Urethra.* *N. York M. J.*, 1920, cxii, 521.

When a patient presents himself with a urethral discharge it is necessary first of all to determine whether the infection is specific or non-specific, and

if the latter, to discover the nature of the underlying factor.

According to Luys, the most important organisms which have been found in non-specific urethral discharges are streptococci, the bacillus coli, pneumococci, staphylococci, various sarcinae, the diphtheria bacillus, the tubercle bacillus, micrococcus fallax, micrococcus aureus and albus, and micrococcus catarrhalis. There are also aseptic inflammations in which no organisms can be found, the microscope revealing nothing but pus cells, a few epithelial cells, and occasionally strings of mucus.

While on superficial observation the difference between the symptoms of acute catarrhal infection and those of the typical gonococcal infection seems slight, it will be found to be a decided difference if the examining physician has acquired the ability to detect it. In catarrhal infections the symptoms are generally less severe, the discharge is less profuse and apt to be more watery or mucoid in its character from its incipency, the urinary discomfort is slight or absent, and the meatus is but slightly or not at all inflamed.

The micrococcus catarrhalis can be distinguished from the gonococcus only by culture. The former grows profusely on agar and in this respect differs both from the gonococcus and the meningococcus.

When an answer to the question whether or not a urethral inflammation is due to the gonococcus must be obtained more quickly than is possible by clinical observation, dependence must be placed on cultures of the urethral discharge if the microscope cannot decide the matter.

The colon bacillus is not an infrequent agent in the production of urethral inflammation, especially in persons suffering from rectal and other intestinal disturbances. Clinically the condition resembles catarrhal infection. The microscope shows the absence of diplococci but a culture reveals the colon bacillus.

The remaining non-specific types of urethritis are so rare that they need be referred to only with the warning that they should be kept in mind in the examination of every case in which the picture departs in any appreciable degree from that of the classical specific urethritis. Chief among these types is the pyogenic or purulent urethritis following the introduction of unclean catheters or sounds into the urethra.

The urethritis associated with the development of a syphilitic chancre at or within the urethral meatus is less frequent. This type is most deceiving for the meatus appears red and swollen, the discharge is rather profuse, and the urine is purulent. The lips of the meatus, which are rather whitish and shiny, stand apart and when they are felt between the fingers the typical induration of the initial lesion can be perceived. Gonococci are absent.

Chancroidal infection of the urethral meatus resembles the type just mentioned except that it is characterized by the chancroidal ulceration without induration at the site of infection.



Acute gonorrhœa begins with an acute specific triad—angry appearance of the meatus, a profuse discharge, and purulent urine—but the absolute diagnosis never should be made unless the bacterial findings are positive.

In the diagnosis of urethritis it is important to know whether the condition is a new infection or an exacerbation of an old one. In the examination of a large number of urethral discharges microscopically it was noted that leucocytes predominate in the acute infection, epithelial cells being few in number or absent, while in chronic infections epithelial cells predominate and the leucocytes are relatively few.

The next step in the diagnosis is to determine whether the infection has been confined to the anterior urethra or has passed beyond the cut-off muscle into the posterior urethra.

The symptoms of chronic urethritis vary considerably. The most frequent symptom is a urethral discharge, usually designated as the "morning drop." Less frequently there is an elusive discharge which occurs irregularly. Both of these types may be most elusive.

In any given case of chronic urethral discharge it is necessary first of all to determine the origin of the condition. This cannot be discovered by the urethroscope nor by examination of urine passed into three, five, or more glasses. A careful study and application of the tests referred to is necessary. If there is the slightest ground for the suspicion that the pus in the urine is derived from the bladder or a focus higher up in the urinary tract, however, the five-glass catheter test (Wolbarst) will give definite information eliminating the doubt.

The origin of the pus or shreds having been discovered, the next step consists in locating the lesion and determining its character.

The most frequent lesion is stricture. Less frequent are folliculitis, prostatitis, and vesiculitis, and their respective variations. Occasionally it will be impossible to discover any of these conditions but a careful examination made with the posterior urethroscope will reveal a well-defined inflammation of the verumontanum and the adjacent urethral roof, floor, and walls.

Prostatitis is found in practically every case of chronic urethritis, possibly because nearly every prostate examined is more or less congested and it is not an easy matter to draw a sharp line between the normal congestion and the pathologic inflammation. A prostate that is larger than the average normal organ, tender on pressure, and exuding abnormal material after massage must be considered pathological.

THEODORE DROZDOWITZ.

**Taddei, D.: The Rational Treatment of Urethral Strictures** (Il trattamento razionale dei restringimenti dell' uretra). *Riforma med.*, 1920, xxxvi, 790.

According to the author's clinical experience, internal urethrotomy is an operation to be avoided. While this procedure gives very good results in septic and toxic cases as well as those in which there are

other organic lesions, it is associated with a very high mortality. All types of strictures can be treated by progressive dilatation. This should be continued until a No. 56 Bénique sound can be inserted in the urethral orifice.

When, owing to local or general conditions, slow methodical dilatation is not feasible, urethrotomy may be avoided by resorting either to catheterization through a conductor or to circular electrical dilatation. The conductor used is somewhat similar to that employed in the Maisonneuve urethrotomy. For twelve years Taddei has treated urethral stricture by passing a sound through a dilating conductor and has obtained excellent results. It has never been necessary to perform a urethrotomy in these cases and there were no deaths. Dilatation gives more permanent results than urethrotomy.

Circular electrolysis may be applied either through a conductor or with a Bénique sound. The negative electrode of a continuous current is applied to the extremity of a catheter introduced into the urethra, the positive electrode being applied externally over the back or over the abdomen. This is a simple method of modifying the elasticity of sclerosed urethral tissues and soon overcomes the stricture.

The author admits that external urethrotomy, urethrectomy, and urethrorrhaphy, perineal urethrostomy, and suprapubic cystostomy have their indications in special cases.

Attention is called to the necessity for rigorous asepsis, great patience, and gentle instrumentation in all urological operations. In cases of stricture urethroscopy is practically useless.

W. A. BRENNAN.

**Thévenot, L.: The Various Indications for Perineal Mobilization of the Urethra and the Lower Part of the Bladder** (Des différentes indications que peut remplir la mobilisation périméale de l'urethre et de l'extrémité inférieure de la vessie). *J. d'uroi. méd. et chir.*, 1920, x, 99.

Surgery of the deep urethra, the prostate, and the fundus of the bladder by the perineal route is always difficult because the surgeon is working on organs which he cannot bring to the surface.

The author refers to the progress made in this branch of surgery since Rochet in 1916 freed the mid-perineal aponeurosis. It is this aponeurosis which immobilizes the urethra, the prostate, and the bladder. Thévenot describes Rochet's technique in detail.

A reversed V-incision is made in the perineal region, the apex of the V corresponding to the symphysis pubis and the sides terminating at the level of the ischium. The anterior surface of the rectum is laid bare as in perineal prostatectomy. The membranous urethra is sectioned completely and transversely just behind the bulb. By the use of the rasp on the entire extent of the ischiopubic ramus the roots of the corpora cavernosa are reached. Care is necessary to prevent hæmorrhage. The cutting of the aponeurosis is begun slightly



inside the ischiopubic ramus, the deep perineal branch of the artery and the internal pubic nerve being left outside. When the lateral attachments of the aponeurosis are progressively liberated its upper attachment under the subpubic transverse ligament is freed with the rasp, care being taken to spare the important veins. The subpubic and retropubic veins are carefully dislodged with the finger. The deep urethra is then seized with the forceps and a search is made for the attachments of the prostate. By traction alone it is then possible to draw the deep urethra, the prostate, and the bladder outside the pelvis.

In practice, the conditions in which the method described is indicated are those in which it is necessary to approach the posterior urethra, the prostate, or the vesical fundus or to expose the lower extremities of the ureters. Lesions of the deep urethra which call for the method include extensive traumatic injury of the urethra, urethrorectal fistulae, and severe strictures which deviate the canal. The prostatic lesion which is the most frequent indication for the procedure is cancer. Rochet recommended his method also for urethrostomies in cases of old, incurable strictures of the pendulous urethra, and for cases in which it is desired to do a perineal cystostomy.

In cases of cancer of the vesical fundus with or without extension to the prostate resection of this portion of the bladder by the high route is ordinarily difficult and the operation is often a blind procedure. Mobilization of the aponeurosis to liberate the prostate and the vesical fundus surmounting it therefore appears logical. To date, however, this method has been used for the removal of cancer in this region only in experiments on the cadaver.

W. A. BRENNAN.

#### GENITAL ORGANS

**Barker, L. F., and Ward, J. A.: Gummatous Epididymitis and Gummatous Osteoperiostitis of the Humerus.** *South. M. J.*, 1920, xiii, 794.

The authors state that although syphilis may attack any part of the body, certain regions, as is well known, are relatively less often affected than others. Among these is the epididymis. On account of the comparative rarity of the condition and because of certain difficulties in the diagnosis, they record in this article a case of luetic epididymitis which recently came under their observation.

The patient was a man 61 years of age who complained of pains and swelling in the upper part of the right arm and a non-painful swelling in the right half of the scrotum. The chief positive finding in addition to these was a positive Wasserman reaction of the blood. The condition was diagnosed as lues although the surgeon believed it to be tuberculosis. Arspenamin treatment relieved the pain at once, and after six weeks the swelling in the arm and epididymis disappeared entirely.

An interesting feature of this case was the fact that the patient had had all his teeth extracted as possible sources of infection for what was regarded at first as neuritis.

The article is concluded with the statement that the case shows the importance of a general diagnostic survey of the body as a whole and the advisability of trying thorough antiluetic treatment before operating upon a testicle or epididymis suspected to be affected by tuberculosis or a neoplasm.

V. D. LESPINASSE.

#### MISCELLANEOUS

**Morini, L.: Modern Methods of Treating Inguinal Periadentitis of Venereal Origin** (Circa i metodi moderni di cura della periaidite inguinale d'origine venerea). *Riforma med.*, 1920, xxxvi, 1046.

The method of treating inguinal bubos used in the author's clinic is a modification of Somogyi's method of injecting into the cavity a suspension of iodoform in 10 per cent glycerine. The solution used by Morini consists of iodoform, 10 parts; rectified alcohol, 20 parts; and very pure neutral glycerine, 80 parts. Besides rendering the fluid more liquid and facilitating its entry into all parts of the cavity, the alcohol slightly irritates the walls of the cavity and thus causes a more active superficial circulation and a more abundant flow of organic fluids into the cavity.

The subjective phenomena which follow the injection are slight. In the author's experience the addition to the solution of 5 per cent camphor and 5 per cent guaiacol renders the injection painless. Before the injection is given a very small incision is made in the most prominent part of the bubo to drain the pus but no attempt is made to express all of the pus at once. The injection is given with a glass syringe, the amount of fluid injected being sufficient to fill the cavity completely. The area is then enveloped in a gauze compress bound moderately tight.

The method described may be used also in cases of suppurative glands which have opened spontaneously. Recovery occurs in from four to six days, the maximum time being eight days.

W. A. BRENNAN.

**Morson, C.: Radium in the Treatment of Malignant Disease of the Bladder and Male Genital Organs.** *Brit. J. Surg.*, 1920, viii, 36.

The author has studied the action of radium on normal mucous membrane and skin. Definite degenerative changes take place; the mucous membrane becomes covered with a gray film similar to that seen in the early stages of leukoplakia. On separating from the underlying tissues the film leaves a thin shallow ulcer which is tender and slow to heal.

The malignant cell responds to radium rays in direct proportion to its reproductive activity. When sepsis complicates malignancy the patient's resist-



ance is much lowered and the cancer grows rapidly. The reproductive activity of the cell is increased, but the control of the infection requires such large doses of radium that the surrounding tissues are damaged. Prolonged exposure to large doses of radium also lowers the phagocytic power of the white cells and in some cases the leucocytes are completely destroyed.

In treating malignant conditions of the bladder several methods of applying radium are employed. Suprapubic radiations are sometimes used, but the value of this approach is vitiated by the damage done to the suprapubic tissue which receives the brunt of the radiation. The radium may be applied also through a suprapubic opening, but as an eight-hour exposure is necessary to destroy the malignant cell, it is possible that the normal mucous membrane will be damaged. Radium is passed through the urethra by means of an operating cystoscope. This method also permits damage to normal tissue and has the added disadvantage that the instrument must be kept in the urethra for a long period of time. Rectal applications of radium often cause pain and tenesmus, especially if the radiations are confined to a small area.

The author favors burying the radium in the tumor growth through a suprapubic cystotomy. The bladder is drained and irrigated until the infection has subsided; the suprapubic wound is then enlarged and the radium tubes are placed in the periphery of the tumor where the growth is most rapid.

The following changes occur on exposure of the malignant growth to the rays: (1) rapid degeneration

of the malignant cells in the immediate vicinity of the tube of radium; (2) apparent vacuolation and enlargement of the nuclei of the cells beyond the degeneration zone; (3) loss of the reproductive function of the cancer cell; (4) proliferation of the connective-tissue cells, a change resembling the attempt of nature to arrest the development of cancer through the new formation of fibrous tissue; and (5) thrombosis of the blood vessels, which leads to the arrest of hæmorrhage and shrinkage of the malignant mass. Excessive exposure causes rapid necrosis of the tumor and at times sloughing of the normal tissues.

As in rectal or urethral application of radium for carcinoma of the prostate there is a possibility of injuring the normal structures, the author inserts radium tubes into the prostate itself. General anæsthesia is of value. The gland is exposed through a median incision. If the disease has not penetrated the capsule, removal of the gland is indicated.

Radium should be used on inoperable tumors of the testicle only when the extension of the growth is limited to the iliac fossæ. Metastatic cells from a testicular growth are remarkably sensitive to radium rays, a small dose causing a marked reduction in the size of the tumor. Under local anæsthesia small tubes of radium are buried in the affected glands and left for eight hours.

Growths which rarely give rise to metastasis, such as those in the bladder and prostate, respond most readily to radium treatment.

A. J. SCHOLL, JR.



## SURGERY OF THE EYE AND EAR

### EYE

Hill, E.: *Cyclopia, Its Bearing upon Certain Problems of Teratogenesis and of Normal Embryology; with a Description of a Cyclocephalic Monster*. *Arch. Ophthalm.*, 1920, xlix, 597.

The purpose of this article is indicated as follows: (1) to present the newer conceptions regarding cyclopia which are not found in the literature of ophthalmology, and (2) to discuss certain questions of embryology suggested by the study of cyclopean eyes.

A brief summary of the history of monstrosities follows. Mythology, the idea of the supernatural causation of monsters as a punishment or a warning of disaster, and early attempts to explain them on the basis of natural causes are reviewed, including the very fanciful conjectures such as the theory that monsters are hybrids, half human and half beast. The theory of maternal impressions is condemned as utterly fallacious and impossible on embryological grounds as well as cruel because of the distress it causes unfortunate mothers. The early experiments in monster production are mentioned, especially those on chick embryos which were studied by the St. Hilaire and Dareste. The latter brought experimental embryology to a high degree of perfection and made an impression upon his successors which persisted for fifty years, being superseded only recently by more accurate studies of cyclopean embryos.

Modern theories of teratogenesis are discussed under two general headings, the germinal theory and the non-germinal theory. The non-germinal origin, or environmental cause, of monstrosities is emphasized as applicable to the greater number of monsters, including cyclopia. As Mall said, every ovum possesses the power to become a monster if its normal development is interfered with. The non-germinal theories are divided into the mechanical, the pathological, and the embryological theory.

The cyclopean eye is described as a fusion of two eyes in the lower middle part of the forehead. All the structures composing the eye are modified by pressure and all remain in the foetal state of under-development. The most important failure of development is in the retina and optic nerve which share in an extensive mal-development of the central nervous system.

Other deformities associated with the cyclopean eye are the rudimentary and displaced nose which appears as a proboscis above the eye, the absence of the ethmoid and bones of the face which normally occupy a median position, and widespread destruction of the cranium and central nervous system which may amount to anencephaly. Hydramnios,

general oedema, heart anomalies, and absence or aplasia of the suprarenal bodies and superior cervical ganglia are frequently associated with cyclopia.

The older theories as to the mechanism of cyclopia are discussed. The assumption that primary bony abnormalities, inflammatory processes, and amniotic adhesions to the embryo are causes has given way to more exact embryological explanations based on investigations which have shown that the eye-forming material in the anterior end of the primitive nervous system is affected by an arrest of development very early.

The author's specimen, a female human foetus nearly at full term, with a cyclopean eye and practically no brain and spinal cord is described in gross and microscopic detail. It did not differ in any important respect from other cyclopean monsters recorded in the literature and emphasis is laid not so much upon this individual specimen as upon the problems of teratology and embryology suggested by the cyclopean type of monster in general.

Modern experimental teratogenesis is introduced by reference to the work of Driesch, Loeb, Schultze, Wilson, von Pflueger, Roux, Hertwig, Lewis, Spemann, and others who showed that the development of embryos can be altered by mechanical and chemical changes in their environment. Stockard's experiments are described in detail and credit is given to him for placing cyclopia upon a definite basis as a monstrosity of the non-germinal type due to arrested development in the central nervous system before the eyes have separated. Stockard's chief work was done between 1907 and 1913 on the teleost fish, *fundulus heteroclitus*. With an excess of magnesium chloride in sea water he produced cyclopean monsters in 50 per cent of his fish embryos. He concluded that the monstrosity is caused by an inhibitory or anæsthetic effect of magnesium upon the nervous system. Stockard conclusively proved the non-germinal origin of these monsters by using the magnesium solution only after the eggs had reached the thirty-two cell stage. Other substances, such as alcohol, chlorotone, and ether, produced monstrosities, but only agents which exerted an anæsthetic effect.

The possibility that the birth of a monstrosity would be prevented if toxic agents were avoided during pregnancy and pathologic uterine conditions were overcome is suggested, but no accurate information on this subject is as yet available.

Cyclopia is classified among the monstrosities most satisfactorily on the basis of Adami's growing-point hypothesis, which would account for it as an abnormality of defect, a "polar hypogenesis" due to premature exhaustion of the growing point or an



arrest in its growth. This is substantially the same as Stockard's theory regarding the "anæsthetic" action of magnesium salts and alcohol upon fish embryos.

Three questions of embryology are discussed in the light of cyclopean abnormalities:

The position of the optic anlage is believed to be median and not lateral in the medullary plate of the embryonic nervous system. There is a single anlage from which lateral extension takes place and two eyes later develop. Stockard has proved this in the salamander, *ambystoma*.

The optic nerve is believed to originate in the ganglion cells of the retina and not in the optic centers of the brain. This conclusion is reached on logical grounds as well as on the basis of the evidence obtained from cyclopean and cerebral monstrosities.

The crystalline lens is believed to possess in a measure the power of self-differentiation, independent of the optic vesicle. Stockard demonstrated this fact in cyclopean fish embryos.

The following conclusions are offered:

"Cyclopia is a monstrosity of the type known as *monstra in defectu*, being the result of a failure in development of the anterior end of the embryonic nervous system. According to Adami, this may be considered a superior pole hypogenesis affecting the region of the superior growing point of the embryo.

"Cyclopia is not a germinal defect, but is a developmental defect resulting from some detrimental influence acting upon the embryo after cell division has begun. The damaging agent seems to act by exerting an inhibitory or anæsthetic effect upon the embryonic nervous tissue.

"Dareste's widely accepted theory that cyclopia is the result of a premature closure of the anterior orifice of the neural tube has been abundantly disproven. Amniotic bands as a cause of cyclopia are, in the words of Mall, a myth of teratology.

"In lower forms of life the cyclopean defect may be sharply delimited, but in man and the higher vertebrates it is part of an extensive defect of the nervous system which may appropriately be termed 'cyclocephaly.'

"Cyclopia is not the result of a failure of intervening non-ocular tissue to develop, allowing two lateral eyes to come together. It is the result of damage to the eye-forming material in the medullary plate, by which separation and lateral extension of the eyes is prevented. The failure of non-ocular tissue to develop is the result and not the cause of cyclopia.

"The study of monstrosities and pathologic ova offers hope that these calamities can be prevented if pathologic uterine conditions and substances in the maternal circulation which are toxic to the embryo are removed.

"The study of cyclopean eyes and experiments suggested by this study indicate that the eye-forming material is median and not lateral in the anterior portion of the medullary plate of the embryonic

nervous system. Practically a single optic anlage exists, from which two eyes develop by lateral out-pushings. Whether a few cells in the midline intervene between the two halves of this anlage, according to Lewis, or no such separation exists, according to Stockard, is a question of little practical importance.

"The logical opinion that the optic nerves originate from the ganglion cells of the retina rather than from cells of the brain is strengthened by the study of cyclopean specimens in which the brain is absent or rudimentary.

"The study of cyclopean eyes in lower vertebrates indicates a degree of independence on the part of the lens-producing ectoderm of the head end of the embryo. This self-differentiation of the crystalline lens is, however, a much less potent factor than the influence of the optic vesicle upon lens production."

Chipman, L. D.: A Consideration of the Thomson-Curtin Operation for Detached Retina, with Report of Two Cases. *Canadian M. Ass. J.*, 1920, x, 1007.

The author reviews the articles of Thompson and Curtin published in 1915 in which it is concluded that retinal detachment is due to a lymphatic derangement leading to exudation from the choroidal vessels which forces the retina away. On the basis of this hypothesis it appeared that the logical treatment would be a procedure which would drain this fluid. Such drainage was obtained by raising a conjunctival flap, trephining the sclera with an Elliot trephine, and repeatedly aspirating the fluid with a syringe.

Thompson reported 2 successful cases out of 17 operated upon in this way and Chipman reports 2 others.

F. P. SCHUSTER.

## EAR

Shambaugh, G. E.: Popular Fallacies in the Practice of Otology. *Laryngoscope*, 1920, xxx, 683.

The author points out the following popular fallacies in the practice of otology:

1. The assumption that any alteration in the nasal passages, especially such usual anatomical variations as irregularity of the nasal septum and the compensating variations in the size of the lower and middle turbinated bodies, are causes of middle ear disease, whether or not unmistakable nasal symptoms are present.

2. The assumption that in all cases of obstructive middle-ear deafness long-continued inflation of the middle ear is indicated.

3. The assumption that the progress of deafness may be checked by local treatment, whether the deafness is the result of degeneration of the eighth nerve, primary fixation of the stapes, or chronic adhesive middle-ear processes.

4. The assumption that all cases of chronic discharge from the ear which cannot be checked by local treatment in a reasonable period are cases in which radical surgical measures are indicated.



5. The assumption that persistence of moisture after the radical mastoid operation indicates the failure of this operation. O. M. ROTR.

**Andrew, F.: Suppurative Middle Ear.** *Med. J. Australia*, 1920, ii, 376.

In discussing the indications for operation in the chronic suppurative affections of the middle ear the author mentions first those conditions for which the necessity or advisability of the radical operation is usually granted, namely:

1. Cases in which there are manifest signs of beginning invasion of the labyrinth or fallopian aqueduct.

2. Cases of chronic suppuration of the ear complicated by gross mastoid signs or symptoms.

3. Cases in which only one ear is involved and the patient's financial status makes adequate post-operative care impossible.

4. Cases of gross cholesteatoma.

5. Cases in which the conversational voice cannot be heard at a distance of more than 15 cm., the deafness being of a type offering no prospect of improvement.

5. Cases already operated upon, perhaps many times, unsuccessfully.

The author discusses next the various grades of chronicity of suppurative middle-ear disease concerning the treatment of which there is the widest diversity of opinion.

Andrew believes that the treatment should be determined on the basis of the pathology of the individual case. Cases may be classified into two main sub-classes as follows: (1) those in which the ossicular chain is unbroken; (2) those in which the ossicular chain is broken.

In Type 2, when the mastoid or attic condition demands drainage, a radical operation should be done as there is no effective middle-ear apparatus to be saved.

Cases in which the ossicular chain is unbroken the author discusses at some length, dividing them into three classes: (1) those with the perforation anterior or antero-inferior, (2) those with a posterior perforation, and (3) those with the perforation in Shrapnell's membrane.

When the perforation is anterior almost all treatment is limited to the nasopharynx and tube and local treatments are given to the middle ear.

When the perforation involves Shrapnell's membrane, the attic must be dealt with.

When the perforation corresponds to, and is limited to, the outer wall of Prussac's space it may accompany a simple and easily resolved inflammation involving no other structures and is one of the common types of "sea-bathing otitis." When the Shrapnell perforation is extensive, the discharge is purulent and there is perhaps evidence of retention; a gross attic suppuration is present almost invariably which is maintained by antral suppuration in addition to the exceedingly poor drainage afforded by the outer partition of the attic, while the bodies

of the incus and malleus remain *in situ*. In all but the earliest cases there may be, in addition, local caries of the bodies of the incus and malleus which are very inaccessible to local treatment while the outer attic wall remains. In these cases it is necessary to operate early to save one ossicular chain or, in other words, to save hearing.

For this type the author prefers the Bondy operation as it exposes the bodies of the malleus and incus for after-treatment in the same way as the inner tympanic wall is exposed by the radical operation.

Andrew considers cases with posterior perforation very difficult to treat because, in addition to the tubal factors, consideration must be taken of two important unknown factors: (1) the attic, and (2) the antrum and cells. How to arrive at an opinion regarding the attic state and the integrity of the ossicular chain remains to be determined. The author's line of reasoning is as follows:

When the incudo-stapedial joint is intact, the bodies of the malleus and incus may recover and the radical operation should be postponed. If the attic is choked with granulations and has been so choked for a long time, the joint is not intact. In the final analysis the surgeon's judgment is the court of last resort. He, therefore, must carefully weigh all the available evidence before operating. In some cases, however, the final decision can be made only when the pathological state is revealed by operation. The factors which will influence the decision are the duration and severity of the disease, the tendency of the tympanic structures to improve during treatment, the usefulness of the other ear, the patient's general health, occupation, age, and economic and geographic status as regards the possibility of prolonged postoperative treatment, of intermittent but skilled care for subsequent years, and the possibility of secondary operation if a non-radical operation fails to cure. If there is doubt as to whether resolution will occur after further information has been obtained during a simple mastoidectomy, the attic must be exposed by partially removing its outer bony wall. Bondy's operation carried to a point far short of the external atticostomy for the cure of cases with purely Shrapnell perforations will give invaluable data as to the state of the attic and ossicles. The mastoid being thoroughly cleared, the skin lining of the external auditory canal may be pushed forward or turned out with impunity and the posterior bony canal wall may be taken down to the neighborhood of the annulus. The outer bony wall of the attic may be reduced to a thin plate and its upper two-thirds may be removed to expose the attic and much of the ossicle bodies without compromising in any degree the surgeon's power to stop short here.

O. M. ROTR.

**Coates, G. M.: Acute Mastoiditis — Indications for Operation.** *Therap. Gaz.*, 1920, xlv, 761.

The author discusses the diagnostic value of the following eighteen points in determining the necessity for a mastoid operation:



1. The greater incidence of acute mastoiditis among children than adults.
2. A history of a predisposing cause (cold, measles, scarlet fever, bathing).
3. A history of pain, earache, and aural discharge of some duration.
4. Redness, œdema, or fluctuation over the mastoid process obliterating the tempero-auricular crease.
5. An auricle protruding wing-like from the head.
6. Tenderness over the entire mastoid process or over certain points, e.g., the antrum, the mastoid emissary vein, or the tip.
7. Sagging of the posterosuperior wall of the external auditory canal.
8. Redness, bulging, or perforation of the membrana tympani.
9. Discharge of pus through the perforation or, in the absence of perforation, pus in the middle-ear cavity.
10. Impairment of hearing.
11. Tuning fork tests suggestive of conductive deafness.
12. Moderate fever, between 100 and 102 degrees, without marked fluctuation.
13. Pulse commensurate with the fever.
14. Negative eye grounds.
15. The presence of organisms, usually the streptococcus viridans, streptococcus hæmolyticus, or the pneumococcus, in the aural discharge.
16. A white blood count between 12,000 and 15,000.
17. Cloudiness of the mastoid in the X-ray picture, indicating fluid or the destruction of cell walls.

#### 18. Evidence of an intracranial complication.

While the presence of all of these signs would render the diagnosis easy, it is seldom that they are all noted in one case. Hence the judgment of the surgeon in each instance must determine the issue. None of the findings enumerated may be regarded as a positive indication for operation as some other cause than mastoiditis may be responsible. Accordingly, other causes must be ruled out before due weight can be given to any one sign or group of signs. "It takes a combination of a number of these points to establish an operative diagnosis, and the different combinations are numerous." O. M. ROTT.

**Hammond, P.: Observations of the Healing Processes Following Mastoid Operations.** *Laryngoscope*, 1920, xxx, 662.

In the author's opinion the mastoid wound should be packed only until the middle ear is dry and fine granulations appear in the mastoid. This stage is reached at about the end of the first week or the tenth day. If the secretion is moderate, however, the packing may be omitted, the long cavity filled with boric acid, and a pad of gauze laid over the wound. The next day it will be found that the cut edges of the wound have fallen close together and in from five days to a week the patient will be well. The explanation of what has happened is found in the results of laboratory experiments. Beneath the dense cortex is an empty space. The granulations which formerly occupied this cavity have changed to connective tissue and the connective tissue has contracted. O. M. ROTT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Shambaugh, G. E.: An Unusual Type of Nasal Tuberculosis.** *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 582.

The usual forms of nasal tuberculosis are: (1) the hyperplastic form — a round-cell infiltration which leads to the formation of tissue masses, the tuberculoma; and (2) the ulcerative form, in which the destruction of tissue is conspicuous. The unusual type here reported consists of the involvement of the nasal mucosa by miliary tubercular nodules not associated with general miliary tuberculosis. The author has not found a similar case reported in the literature.

Associated with the discrete pinhead nodules on the left side of the septum there was marked enlargement of the cervical lymphatics, chiefly on the left side. The only other lesion was a nodule the size of a hickory nut in the epididymis on the left side.

Commenting on this case Shambaugh writes: "The question arises whether this was not a case of primary nasal tuberculosis with secondary involvement of the lymphatics. One fact seems clear, namely, that the nasal involvement was not secondary to any pulmonary tuberculosis. The fact, too, that the evidences of tubercular trouble seemed limited to but one side of the nose suggests that the nasal membrane may have been the portal of entrance. It seems quite clear that the cervical adenitis was secondary to the nasal infection, first because the nasal symptoms had been present for some time before the enlargement of the cervical lymphatics became apparent, and second, because the chief glandular trouble was on the same side as was the nasal disease. On the other hand, the presence of a number of tubercular nodules scattered widely over the nasal septum speaks rather against the origin of the trouble being in the nose, where one would expect only a single focus in case the nasal disease was the portal of infection. In view of the fact that the patient had a nodule, probably tubercular, in the epididymis which was present for some time before the other symptoms appeared, it seems probable that this may have acted as the primary focus for the dissemination of the infection, and that the miliary tubercles seen in the nose were secondary to this focus."

O. M. ROTT.

**Scheibe, A.: The Treatment of Papillomata and Papillomatous Carcinomata of the Nose** (Zur Behandlung der Papillome und papillomatoesen Carcinome in der Nase). *Arch. f. Laryngol. u. Rhinol.*, 1920, xxxiii, 501.

The rare multiple papillomata which occur in the upper part of the nose show clinically malignant

characteristics although their pathologic structure would seem to indicate that they are benign tumors. In the literature there is not a single case on record in which a cure was obtained by operation on a tumor of this kind.

The author reports a case in which the entire right nasal chamber was filled with a papillomatous tumor mass which later spread to the mouth through the socket of the second upper molar tooth. A clinical cure was obtained by means of repeated X-ray treatment and the internal administration of arsenic.

Papillomata of the upper respiratory and digestive tracts are also affected favorably by the X-ray and radium, but carcinomata of these areas are very refractory. The author was able to obtain a very good result in only one case of carcinoma of the nose, and in this instance the structure of the tumor was distinctly papillomatous. Of five carcinomata of the œsophagus the only growth which reacted well to mesothorium treatment was papillomatous.

VON TAPPEINER (Z).

**Phelps, K. A.: Sinusitis in Children.** *J.-Lancet*, 1920, n. s. xl, 604.

In a study of 40 cases of sinusitis in children Phelps found that half of them were due to infectious diseases. His conclusions from this study are summarized as follows:

1. Chronic sinusitis occurs in children very frequently and may act as a focus of infection. Every child with meningeal symptoms, anæmia, and an increase of temperature of unknown cause, or with asthma or nephritis, pyelitis, arthritis, endocarditis, headaches, or long-standing colds, bronchitis, indefinite gastro-intestinal symptoms, or cyclic vomiting should be very carefully examined for sinusitis. The most frequent local symptoms are nasal discharge and headache.

2. Sinus infection is diagnosed best by means of the X-ray.

3. Most cases recover without a radical operation; palliative measures usually suffice. If oily sprays and astringents fail to establish drainage and ventilation, the removal of the tonsils, adenoids, and the anterior tip of the middle turbinate will often bring about the desired result.

O. M. ROTT.

**McGinnis, E.: Intranasal Drainage of the Frontal Sinus and Anterior Ethmoid Cells.** *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 631.

By the method proposed the frontal sinus is drained forward and very much higher up than in other methods; any cells in front of the unciform groove are cut through, the front wall of the ethmoidal bulla is opened so that the upper cells are given



two openings, one natural and the other artificial, and the front wall of the inferior cell of the bulla which drains behind the insertion of the middle turbinate is incised. Although the effort is made to open the way to the frontal sinus as near to the frontal ostium as possible, no special effort is made to break into the sinus.

With the patient sitting in a chair and under local anaesthesia, the head is placed in extreme extension and with Gruenwald's forceps a bite is made into the mound of an agger cell, if such a cell is present, or into the front of the ethmoid labyrinth above the attachment of the middle turbinate, the attachment being left intact. If one or more agger cells are present, part of the inferior, superior, and posterior walls is cut away, and above these some of the front wall of the nasofrontal duct. Next, with the same forceps, the free border of the turbinate is pushed toward the septum and an opening is made through the front wall of the bulla, thus opening all the cells. All cutting is done in an up and down direction parallel with the orbital and turbinal plates. If the catheter can be passed into the frontal sinus the sinus is irrigated.

O. M. ROTT.

**Unger, M.: Intranasal Drainage of the Frontal Sinus Through the Natural Opening.** *N. York State J. M.*, 1920, xx, 351.

The method described is intended for the treatment of cases in which the natural frontonasal opening is intact and no operation more extensive than the removal of polyps or the anterior tip of the middle turbinate has been done. Rubber or fabric drainage tubes are introduced into the frontal sinus through the natural opening and left in place during the course of the sinusitis.

The instruments necessary are: (1) a slender frontal-sinus probe, and (2) rubber, silk, or linen catheters varying in size from Nos. 4 to 10 French. The largest catheter that the frontonasal opening will admit is used. An ordinary urethral catheter cut down to  $3\frac{1}{2}$  in. from the tip and perforated at intervals of  $\frac{1}{2}$  in. may be employed for this purpose. The technique is as follows:

The nasal mucosa is anaesthetized and the frontal sinus is probed. The probe is first used alone to determine the size and direction of the frontonasal opening. If the opening is obstructed by the middle turbinate the latter is removed. The size and direction of the opening having been ascertained, the probe is pushed through the lumen of the catheter to its end and, encased in the catheter, is re-inserted in the frontal sinus. This having been done, the catheter is held loosely with the fingers of one hand and the probe gently withdrawn with the other, the catheter being left *in situ*. The catheter is then grasped near its entrance into the opening with a nasal forceps and pushed into the frontal sinus as far as it will go easily. As it is flexible it will pass over projections that would block a metal catheter. After its complete insertion, its lower end is cut off so that the remaining portion rests on the

floor of the nose. This leaves a tube about  $2\frac{1}{2}$  in. long extending from the floor of the nose up into the frontal sinus. The catheter is left in place for one or two days and then removed and replaced by another. Before the insertion of the new tube the sinus may be irrigated.

The catheter is cut  $3\frac{1}{2}$  in. long in the beginning in order that its lower end will project from the nose after its tip is in the sinus and thus furnish an end to hold when the carrying probe is withdrawn. If linen or silk catheters are used they should be dipped into hot water to soften them before they are inserted.

Three case reports are given.

O. M. ROTT.

## THROAT

**Cronk, H. L.: Renal Complications of Acute Lacunar Tonsillitis.** *Practitioner*, 1920, cv, 351.

In a review of the literature the author found that the etiological importance of tonsillitis as regards nephritis was considered slight by the older writers, but in later years has been given considerably more attention.

From a study of 30 hospital cases of acute lacunar tonsillitis Cronk found that 24 (80 per cent) showed albuminuria in varying amounts at one time or another.

There is no relation between the albuminuria and the pyrexia as the former does not always disappear with a decrease in the temperature.

The author's conclusions are:

1. Albuminuria is very common in acute lacunar tonsillitis.
2. This albuminuria is not always of the simple febrile type.
3. True febrile albuminuria does occur in some diseases such as influenza.
4. Nephritis occurs in a small but not negligible number of cases of tonsillitis; in such instances it is of the latent variety with few signs.
5. The nephritis occurring in lacunar tonsillitis is similar to scarlatina in its tendency toward cure.

O. M. ROTT.

**Walker, C. B.: The Control of the Lung Abscess Following Tonsillectomy and Retropharyngeal Abscess; the Suction Dissector.** *Laryngoscope*, 1920, xxx, 701.

The author's conclusions are as follows:

1. The danger of the development of lung abscess and pneumonia following tonsillectomy is decreased if the patient is maintained in such a position that the larynx may be kept absolutely clean during the entire procedure and until the patient is sufficiently out of the anaesthesia to be able to clear the throat normally.
2. Suction applied constantly through the dissecting instrument makes it possible to keep the dissection in the plane of minimum vascularization.
3. This improvement in the dissection is associated with a decrease in the amount of bleeding.



4. When properly used, automatic or power-driven anæsthesia apparatus can be made to contribute materially toward a high standard of work.

5. Local anæsthesia will doubtless be used more and more extensively for tonsil operations and the incidence of lung abscess following tonsillectomy will be decreased correspondingly. O. M. ROTT.

**Wylie, A.: The Diagnosis and Treatment of Tuberculous, Syphilitic, and Malignant Disease of the Larynx.** *Med. Press*, 1920, n. s. cx, 391.

In the differential diagnosis of tuberculous, syphilitic, and malignant disease of the larynx it is necessary to determine: the patient's family history, occupation, age, and general mode of living; the kind of hoarseness; the appearance of the larynx; the state of the chest and other organs; the findings of a bacteriological examination of the sputum; and the histologic appearance of diseased tissue which has been removed.

The author tabulates the chief characteristics of each of these conditions as follows:

TUBERCULOSIS	SYPHILIS	EPITHELIOMA
1. Voice weak	1. Raucous	1. Hoarse
2. Pallor of larynx	2.	2.
3. Swelling and redness of posterior portion of larynx and arytenoid cartilage.	3. Swelling and ulceration in anterior end of larynx.	3. Usually on one vocal cord a papillomatous appearing growth and sluggish movement of the cord.
4. Ulcers small and superficial.	4. Ulcers deep and crater-like.	4.
5. Irregular granulations situated in the inter-arytenoid space.	5. Granulations usually on the ventricular band.	5.
6. Epiglottis affected on laryngeal surface.	6. Epiglottis ulcerated on lingual surface.	6. Characteristic histologic structure noted on microscopic examination of removed specimen.
7. Dysphagia.	7.	7. Dysphagia in some cases.
8. Negative Wassermann.	8. Positive Wassermann.	8. Negative Wassermann.
9. Night sweats.	9.	9.
10.	10. Patients generally young males.	10. Patients over middle age.
11. Night sweats.	11.	11.
12. Dullness of pulmonary apex and crepitant rales.	12.	12.
13. Evening rise of temperature and tubercle bacilli in sputum.	13. Recovery follows administration of potassium iodide. Scars on pharynx.	13. Loss of weight; emaciation.

The chief treatment of all forms of laryngeal disease is rest.

In tuberculous disease, open air, soothing sprays and inhalations, the cautery when indicated, and correction of diseases and abnormalities in the nose and nasopharynx are indicated. In syphilitic disease the usual antisyphilitic remedies should be given. In malignant disease limited to the intralaryngeal structures, laryngofissure may suffice; otherwise laryngectomy is necessary. O. M. ROTT.

**Patterson, N., and Pike, N.: Large Cavernous Angioma of the Larynx.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Laryngol., 180.

This tumor was removed under suspension laryngoscopy. There was a broad base of attachment. Externally the attachment reached the lateral wall of the pharynx on the left side and extended from a point opposite the posterior border of the arytenoid as far as the edge of the epiglottis. From here it descended to the left ventricular band and, passing backward, became attached to the whole of the upper surface of the arytenoid.

The mass was severed mainly by the use of scissors. Hæmorrhage was persistent but not excessive. After the patient was removed to her bed, breathing stopped. A laryngotomy was performed immediately but breathing did not begin until a blood clot was removed from trachea. The author admits that a preliminary laryngotomy would have been the wiser procedure. Pathological reports are added. O. M. ROTT.

**Tod, H.: The Removal of Adenoids in Infancy.** *Practitioner*, 1920, cv, 335.

The author strongly urges the removal of adenoids, regardless of the age of the infant, whenever they give rise to any condition which may adversely affect the child's immediate or future welfare.

Tod has frequently performed this operation on babes under 9 months of age—the youngest only 3 weeks old—and has never observed any harmful results.

The danger of delaying the operation until the child is 3 years old is evident from the fact that well-marked signs of middle ear catarrh may develop before this age. O. M. ROTT.

**Turner, A. L.: Carcinoma of the Post-Cricoid Region (Pars Laryngea Pharyngis) and the Upper End of the Oesophagus.** *Proc. Roy. Soc. Med.*, Lond., 1920, xiii, Sect. Laryngol., 199.

When the tumor occupies the cervical oesophagus its lower end reaches to, or passes behind, the manubrium sterni and the growth is not freely accessible.

When the tumor occupies the cervical oesophagus and the post-cricoid region the pathologic changes suggest that it has extended from below upward.

When the tumor is confined to the post-cricoid region, it may be removed successfully.

A thorough examination is necessary to determine in what cases of post-cricoid carcinoma excision will



give the best results. The surgeon should be advised and assisted by a laryngologist.

Careful examination and palpation of the neck are necessary for the detection of enlarged glands, thickening of the tissues suggesting extrinsic extension into the soft tissues of the neck, the larynx, and the trachea, and to discover secondary involvement of the thyroid gland.

Radiography is necessary to detect the vertical extent of the growth, the site of its lower end, and the presence of a second intrathoracic stricture or secondary thoracic glands.

Indirect and direct laryngoscopy and œsophagoscopy revealed changes in the majority of cases studied. Impaired mobility or immobility of one or the other vocal cords implies an extension of the tumor beyond the mucous or muscular coats of the pharynx and contra-indicates operation.

A case in which excision may be done successfully is one in which the tumor is confined to the laryngeal pharynx and the vocal cords still preserve their normal movement. In spite of careful consideration of all the findings, exposure of the tumor area at operation may reveal extension of the disease not previously suspected.

O. M. ROTT.

**Pierce, N. H.: Laryngofissure for Carcinoma, with Demonstration of Specimen.** *Ann. Otol., Rhinol. & Laryngol.*, 1920, xxix, 595.

The author urges the application of laryngofissure to cases of suspected carcinoma which are small, intrinsic, and limited to one side of the larynx.

Pierce uses the tracheotomy tube only when the denuded area will be large, when a part of the interarytenoid region is to be removed, and when radium or the X-ray is to be employed. The tube should be introduced at least eight days before the larynx is opened.

After the growth is excised the cautery should be used to seal up the cut surfaces of the soft parts, and during this procedure the opposite side of the larynx should be protected from the steam by means of a pledget of moist gauze and the patient instructed to hold his breath in order to prevent a bronchitis due to inhalation of the steam.

It is unnecessary to tampon the larynx afterward. Usually the author closes it immediately as he believes the disadvantages from leaving it open for radium treatment greatly overbalance the benefits derived from the use of radium.

O. M. ROTT.

#### MOUTH

**Leech, J. W.: Salivary Calculus.** *Rhode Island M. J.*, 1920, iii, 219.

A case of salivary calculus located in Wharton's duct is described. The patient had had a swelling below and anterior to the angle of the jaw for eight days. During a similar attack seventeen months before all her teeth had been extracted and she was treated with vaccines presumably on a mistaken diagnosis. The swelling subsided in about three

weeks. The author discovered the calculus by probing the duct. As it was impossible to dislodge it by enlarging the duct opening, the duct was incised directly over the calculus.

HENRY J. VANDEN BERG.

**Schmiegelow, E.: The Action of Radium upon Inoperable Malignant Tumors of the Mouth, Throat, and Nose** (Einige Beobachtungen hinsichtlich der Wirkung des Radiums auf inoperable, maligne Neubildungen im Munde, Rachen und in der Nase). *Arch. f. Laryngol. u. Rhinol.*, 1920, xxxiii, 1.

Schmiegelow reports in detail 11 cases of inoperable cancers of the mouth, throat, and nose treated with radium. To improve the results he employed Berven's prosthesis technique for fixation of the capsule. By this method the radium capsules are introduced into dental molds which have been softened in warm water. The molds are then fashioned into the proper shape and allowed to cool and harden. By means of them it is possible to fasten the capsule at the exact spot desired. A well-fitting prosthesis causes little inconvenience. The patient may remove and replace it at will without changing the position of the radium capsule.

The prosthesis can be made most easily when the tumor is situated in the fore part of the mouth. If it is necessary for the radium to extend below into the sinus pyramidalis the masses are molded first over the posterior molars and by repeatedly reheating, the prosthesis is elongated.

In cases of tumors of the nasopharynx the radium tube is inserted in one end of a drainage tube and the tube is ligated at both ends of the capsule. Then, by means of a Belocque tube, the other end of the drainage tube is passed through the nose and drawn forward until the capsule end lies directly in front of the tumor.

KOLB (Z).

**Dunning, H. S.: Surgical Treatment of Chronic Maxillary Sinusitis of Oral Origin.** *J. Am. M. Ass.*, 1920, lxxv, 1391.

The author estimates that 50 per cent of the cases of maxillary sinusitis are of dental origin. In this he differs from the rhinologists who are of the opinion that from 70 to 90 per cent of such cases are secondary to infections originating in the nose or some sinus accessory to the nasal cavity.

Dunning's estimate is based largely upon his own experience and the opinion of his confreres in the practice of oral surgery. Owing to the now more common use of radiography, numbers of low-grade dental or oral infections which have been overlooked in the past are today frequently recognized. Often a mild chronic or latent infection of the maxillary sinus escapes detection because of the ready and convenient drainage afforded through the middle meatus of the nose. The author therefore suggests a thorough radiographic examination of all diseased teeth and the removal of all necrosed or infected osseous and soft tissues even when this implies opening into the maxillary sinus.



It is important also to supplement the head plates with a careful radiographic examination of the teeth and their surrounding tissues. In this connection Dunning cites a case which would not yield to treatment at the hands of the rhinologist after a radical antrum operation. A diseased bicuspid tooth was left in position and upon its removal it was found that the socket communicated with the maxillary sinus through a diseased area which surrounded the root.

As regards the treatment of chronic sinusitis a number of factors worthy of careful attention and observation are pointed out. These are axiomatically summarized as follows:

1. Cure the antral disease as soon as possible.
2. Close the communication between the tooth socket and the antrum at an early date.
3. Do not remove healthy teeth as in the Cowper operation to secure drainage.
4. Discontinue draining with gauze as soon as possible as the gauze may act as a wick and carry infection from the oral cavity into the maxillary sinus.
5. Avoid all appliances provided with rubber or metal plugs or tubes to secure continuous drainage. This form of treatment is not only unsatisfactory but opposed to all precepts of surgery.

In the treatment of diseases of the maxillary sinus as in other branches of surgery the restoration of the normal anatomical relationship and the physiological function of the parts is of prime importance. When an opening into the maxillary sinus does not close Dunning advocates its obliteration by means of a flap operation. This procedure he describes and illustrates.

A flap of tissue taken from the palatal mucoperiosteum is more satisfactory than a flap taken from the buccal aspect of the parts. The incision is carried from the juncture of the hard and soft palates through the median line to the gingival area opposite the bicuspid, through the anterior aspect of the edentulous portion of the alveolar ridge, and beyond the orifice on the buccal aspect. The bed of the flap is prepared by removing all the soft tissues from over the opening to be closed, down to the bone, and by smoothing away all rough bony edges. The labial soft tissues are next undermined on the anterior aspect of the maxilla, often to the extent of an inch. The palatal flap which has been raised is slid over the denuded area and its outer edge is tucked under the liberated buccal tissues. These overlapping tissues are sutured together, preferably with heavy horsehair ligatures. Though the blood supply is abundant in these areas, care must be taken to avoid tension of the tissues.



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# INTERNATIONAL ABSTRACT OF SURGERY

APRIL, 1921

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

Todd, A. H.: *The Technique of Re-Amputation.*  
*Brit. J. Surg.*, 1920, viii, 88.

Re-amputation of a limb is occasionally necessary because it is impossible for the patient to wear or to be fitted with a useful artificial limb. Amputation through the juncture of the middle and lower thirds of the leg is more desirable than amputation through the lower third. Disarticulation through the elbow or the knee does not bring as good results as amputation higher up.

If a useful amount of flexion is to be retained at the joint above, an arm stump must be 10 cm. long, a forearm stump 10 cm. long, and a thigh stump from 12 to 14 cm. long. In certain cases a very short stump below a joint is actually detrimental and should therefore be sacrificed. If the knee is stiff, amputation through the tibia offers little or no advantage. Resection should be done higher up so that a hinge joint may be applied at the knee joint.

The best shape for a stump is that of a converging cone that fits snugly into the bucket and affords a wide surface over which pressure and weight-bearing may be distributed. This eliminates any necessity for end-bearing.

Pain in a stump may be subjective in origin or due to fibroneuromata, scar tissue with small nerve filaments caught up, areas of chronic periosteomyelitis, or bone proliferation with spike formation. In others a skiagram may show a sequestrum separating.

The entire stump in some cases appears to be more or less tender. The tissues are somewhat indurated and of a tough, rubber-like consistency so that it is impossible to distinguish the skin, fat, and muscles by palpation or to move them over one another. This condition is usually the outcome of a septic lesion which also explains the formation of neurofibromata seen practically only in septic cases.

No operation for the relief of pain or tenderness in an amputation stump will be wholly successful if a zone of latent sepsis is entered in the process or

if there is the least tension in the coverings of the stump. In civil practice the rule that the combined length of the flaps shall equal one and one-half times the diameter of the limb at the level of bone section is not applicable since often there is considerable suppuration with consequent shrinkage and retraction. Retraction may be due also to contraction of the cut and abnormally excitable stump muscles.

The idea that short flaps can be brought down after suppuration has been cured is false. In septic cases it is best to amputate as low as possible by the flapless method, get rid of infection, and re-amputate later through normal or comparatively normal tissues; this allows a clinically aseptic course and ample stump covering, and prevents tenderness.

The author believes the attempt to drag down flaps of insufficient length by means of weight or by elastic traction is futile since a satisfactorily covered stump is not obtained in this manner. To prevent retraction and to overcome the tendency to muscular spasm, however, this means is a wise and useful procedure. If a flap is short and the stump is of sufficient length, it is best to re-amputate at a higher level. If this is not done, an ample covering for the end of the bone should be applied by means of a pedicled flap from some other part of the body such as the anterior abdominal wall. In this way a very satisfactory result can be secured.

Block excision of all the pathologic tissues involved and their removal *en masse* is the procedure of choice in re-amputation. To illustrate the technique in such cases the author assumes a case with a more or less pointed thigh stump in which the bone is inclined to protrude, the cutaneous scar is rather thick and irregular, the muscles toward the end of the stump are stretched and fibrotic, and there has been sinus formation at some preceding time. Since a tourniquet may be dispensed with, an incision is made with an ordinary scalpel through the normal skin as near the scar as possible. The incision is then deepened through the fat and superficial fascia, the scalpel being held obliquely so that it cuts in



the direction of a point 3 or 4 in. above the end of the stump. When the deeper layer of the superficial fascia is severed, the skin will usually retract easily and is pulled back forcibly all around the stump to give easy access to the field. A strong amputation knife is now swept obliquely around the muscles, both superficial and deep, down to the periosteum and up to the calculated apex of the cone to be removed. The bleeding vessels are immediately caught and the clamps removed. The main nerves are next brought down and each is carefully injected with absolute alcohol, 2 c.cm. being used for the sciatic and 1 c.cm. for all others. This expedient the author adopted six years ago and since then has not had a single case of pain from neuroma. The only precaution necessary is to be certain the whole thickness is permeated with the alcohol. The pain induced lasts not more than two days and is easily controlled by morphine. Since no disadvantage has been noted, the periosteum is cut off flush with the bone and left.

The muscles are brought together loosely over the end of the stump, and the skin, fascia, and fat are approximated edge to edge in order to secure a thin, mobile linear scar with primary union. A few mattress tension stitches of strong black fishing-gut are passed through the whole thickness of the flaps to prevent retraction of the muscles, to prevent the formation of a hæmatoma and dead-space inside the stump, and to remove all tension on the coaptation skin stitches. The skin is sewed with salmon gut and a drainage tube 3 in. long is passed in the space under the skin and secured at one angle of the wound with a stitch. A large firm dressing of plain gauze and a cotton-wool roll is applied and removed with the tube forty-eight hours later. At the end of ten or twelve days all the skin stitches are removed. The after-treatment amounts to practically nothing, but a bandage may be worn around the stump for a time.

A. C. JOHNSON.

**Whitman, A.: The Establishment of Surgical Principles in the Treatment of Fracture of the Neck of the Femur.** *Arch. Surg.*, 1920, i, 469.

The general attitude of the medical profession toward fracture of the neck of the femur is one of discouragement and disillusionment. Whitman deplores the fact that the force of surgical tradition is to the effect that any treatment is useless. A fracture of this kind is regarded as: (1) an injury of advanced age; (2) an injury for which there is no standard treatment; and (3) an injury differing from others in that the impression is widely prevalent that an intracapsular fracture of the neck of the femur is *per se* incapable of repair.

In 1904 a proper form of treatment was described for the first time, namely the Royal Whitman abduction method. This is based on an anatomical principle and does not necessarily require the use of a plaster cast as the abduction may be obtained by means of an abduction frame. If plaster is used and has been properly applied, it should be both

comfortable and strong enough to permit the patient to be freely moved about. The head of the bed should be raised to prevent hypostatic congestion and the patient may be turned on his face as well as from side to side to prevent bed sores. Movement causes no pain.

Very frequently surgeons neglect to carry out the elementary anatomical details of the method. In such cases only a small degree of abduction is obtained whereas full abduction is necessary to restore the alignment of the fractured bone. Failure may be due also to the fact that the treatment is not continued sufficiently long. Weight should not be borne on the affected limb for six months after the injury.

H. J. VANDEN BERG.

**Lehmann, W.: The Results of Transplantation in Medicine and the Natural Sciences** (*Transplantationsergebnisse aus Medizin und Naturwissenschaften*). *Med. Klin.*, 1920, xvi, 474, 503, 526.

The terms "autoplastic," "homeoplastic," "heteroplastic" are familiar. The term "alloplastic" designates the grafting of dead matter into the living, while the term "parabiosis" is applied to the union of two organisms. By "explantation," on the other hand, is meant the growth of living tissue *in vitro*, in blood serum or lymph. Experimentation with the latter has been of fundamental importance leading to an understanding of the transplantation of tissues. Also of importance is experimentation with botanical transplants, although the laws governing the transplantation of animal tissues are unlike those governing transplantation in plant life.

According to some experimenters certain organs are more compatible than others; for example, the thyroid and bone, and the testicle and lymph glands. Other factors which must be taken into consideration are proper nutrition and the sensitivity of certain tissues to cold, infection, and careless handling. Connective tissue has been found more resistant than epithelial tissue.

The results obtained with homeoplastic grafts are remarkable at first, but sooner or later necrosis sets in. Christiani's experiments with various transplants of genital organs in rats over a period of five years, however, are important. Steinach succeeded in "feminizing" man, and "masculinizing" woman. The failure of homeoplastic and heteroplastic grafts is now explained on the basis of immunization and lack of sufficient nutrition.

Axhausen found that autoplastic bone grafts are mostly absorbed, but that new bone is formed by the medullary contents and the periosteum. Connective tissue, thyroid, testicle, ovary, and various other organs have been successfully transplanted. Autoplastic grafting of skin, fat, and fascia has been successful. Successful heteroplastic grafting of bone and other tissues has also been reported. The fate of the transplant is not to be decided from the reported improvement in the clinical symptoms, however, for this may be due to glandular extracts introduced into the body.



Plange transplanted corneal tissue with success. The patient had lost his vision following an injury inflicted by slaked lime. After the transplantation he was able to distinguish objects at short range.

E. SCHULTZE (Z).

### ANÆSTHESIA

**Burmeister, C. H.: General Anæsthetics for Intra-Oral Operations.** *Am. J. Surg.*, 1920, xxxiv, Anæ. Supp., 114.

The choice of anæsthetic for intra-oral surgery depends primarily upon the patient's physical condition and secondarily upon the skill of the anæsthetist. Chloroform produces a good anæsthesia for mouth work, but the attendant high mortality and frequent postoperative complications contraindicate its use.

Nitrous oxide-oxygen and ether, alone or in combination, are the anæsthetics of choice. Nitrous oxide-oxygen used with the nasal inhaler is ideal for short operations. In long operations, especially when the nasal fossæ or antrum are opened, it is necessary to use ether with the gas. This is best administered by means of the ether attachment on the gas machine. For resection of the jaw, removal

of large cysts of the ramus, resection of nerves, and any operation involving the tongue, the author prefers ether vapor given by the intrapharyngeal method.

For any operation in the mouth, including the extraction of teeth, in which a general anæsthetic is indicated, the dental chair should be replaced by an operating table. While dentists have given nitrous oxide many thousands of times without subjecting the patient to a previous physical examination or determining the blood pressure, this fact merely proves the safety of the anæsthetic and does not justify the practice. The heart, lungs, and urine should be examined in every instance. The preparation of a patient for oral surgery should be the same as for any operation in which a general anæsthetic is administered.

No dentist or surgeon should act as both anæsthetist and operator, and he who does so is not assuring his patient the maximum of safety. A dentist giving nitrous oxide-oxygen for an extraction cannot give his undivided attention to the operation. When complications due to poor administration of the anæsthetic arise during an operation, the operation is generally a failure.

ISABELLA C. HERB.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Kopetzky, S. J.: Report of Six Unusual Cases of Septic Sinus Thrombosis in Children; Operations; One Death.** *Laryngoscope*, 1920, xxx, 763.

In Case 1 the sinus thrombosis involved the jugular bulb and there was pain over the frontal sinus due to pressure of enlarged glands upon the temporo-auricular nerve. Repeated blood cultures were negative. Operation was followed by recovery.

In Case 2 the sinus thrombosis followed acute mastoiditis in a patient suffering from chronic endocarditis. Operation resulted in recovery.

In Case 3 an extensive sinus thrombosis extended backward beyond the knee of the lateral sinus. The temperature was atypical and a positive blood culture was obtained. Operation was followed at first by bilateral facial oedema but ultimately by recovery.

In Case 4 a primary jugular bulb thrombosis presented symptoms suggesting extension toward the cavernous sinus. *Streptococcus viridans* was present in the blood. Recovery followed operation.

In Case 5 a primary jugular bulb thrombosis followed a painless type of mastoiditis. Sepsis was present but the symptoms of mastoiditis were absent. The blood-culture findings were positive. The neurological findings following the operation were unusual. Death resulted.

In Case 6 a lateral sinus thrombosis involved the jugular bulb. Mastoiditis was bilateral and of a painless type. A secondary operation on the bulb

was performed. Temporary facial paralysis set in. Following operation otitic sepsis with abscess formation in the muscles developed. Pulmonary and abdominal symptoms were also noted. Blood transfusion was given. The patient recovered.

Kopetzky gives the histories and describes the operations and findings in these 6 cases in detail, and summarizes his conclusions as follows:

1. The painless type of mastoiditis is a source of potential danger because its gravity is not recognized and it is often not diagnosed.

2. In cases of otitis of more than two weeks' duration which present a picture of sepsis otherwise unaccounted for, the possibility of sinus thrombosis should be borne in mind and blood cultures should be made.

3. When cultures of the blood are repeatedly negative the clinical signs should govern treatment. Exploration of the mastoid process and eventually exploration of the sinus should be undertaken before a fatal type of otitic sepsis or a meningitis develops.

4. The mastoiditis which accompanies primary jugular bulb thrombosis is often negligible as to marked classical symptoms and extent of the lesion.

5. A more general knowledge of the various types of mastoiditis is desirable as all types should not be treated alike. Some present graver risks than others.

6. The findings at operation should be carefully studied as a hæmorrhagic lesion accompanying or following an attack of influenza and giving rise to



septic symptoms makes a survey of the sinus condition imperative as soon as the necessary data to establish the diagnosis are at hand.

E. C. ROBITSHEK.

**Perera, A.: The Indications, Contra-Indications, Methods of Choice, and Results of Hypophysectomy** (La hipofisectomia; indicaciones, contra-indicaciones, métodos, su elección, resultados). *Med. Ibera.*, 1920, xii, 376.

In the author's opinion the fronto-orbital route is to be preferred in the removal of a tumor of the hypophysis. This gives an aseptic and an ample operative field and does not necessitate any decided dislocation of the cerebral lobe. The oedema of the eyelids which develops is temporary, and if the eyeball must be displaced temporarily it is not a very grave inconvenience. A good cosmetic result is obtained with careful technique. If the neoplasm is situated primarily on the sella turcica the intracranial route is best.

W. A. BRENNAN.

**Strachauer, A. C.: The Surgical Treatment of Cerebral Hæmorrhage in the New-Born.** *Minnesota Med.*, 1920, iii, 577.

Prolonged coagulation and bleeding times call for the injection or transfusion of blood. Repetition of such treatment should depend upon the blood findings. In cases of slow bleeding one transfusion may be sufficient. The shortening of the coagulation and bleeding times in cases of severe hæmorrhage is absolutely essential to successful surgical intervention.

In infratentorial cases spinal puncture or punctures may be performed. As much as from 60 to 80 c.cm. of blood may be removed at a time. The tenseness of the fontanella then subsides and the symptoms are immediately relieved. In cases of supratentorial hæmorrhage immediate craniotomy is indicated. This may consist of a decompressive operation or an osteoplastic craniotomy with the removal of the blood. In view of the fact that the hæmorrhage is on the surface of the brain rather than into its substance, a simple decompressive craniotomy without disturbance of the clot may at times suffice, or in very grave cases may be performed preliminary to a later operation for the removal of the blood.

In the presence of focal symptoms, the site of the craniotomy may be anatomically determined. In the absence of such localizing data a single or double subtemporal decompression may be performed.

To locate the site of the hæmorrhage the following procedure is recommended.

Through a 1 in. muscle-separating exposure through the temporal muscle a small button-shaped fragment is removed from the parietal bone. If the blood cannot be seen through the dura, a  $\frac{1}{8}$  in. or  $\frac{1}{4}$  in. incision through the exposed dura will be sufficient to show the presence or absence of blood. If blood is present, an osteoplastic craniotomy may be performed. If it is absent, a second trephine exploration may be performed on the opposite side.

The surgical treatment for cerebral hæmorrhage should be instituted early, preferably during the first weeks of life. Operations for the late sequelæ are rarely indicated.

In four craniotomies for cerebral hæmorrhage performed on infants upon the second, fourth, fifth, and seventh days of life respectively, there were no deaths due to the operation but one child died eight weeks later. The hæmorrhage in the latter case was probably intraventricular. An autopsy could not be obtained. In the remaining three cases prompt relief was given and the children are reported to be seemingly normal.

E. L. CORNELL.

**Coughlin, W. T.: Immobilization of the Proximal Fragment in Fracture of the Jaw Above the Angle.** *Surg., Gynec. & Obst.*, 1920, xxi, 574.

For the procedure described only local anæsthesia is necessary. After anæsthetization of the area, one who is not quite sure of the anatomy would do well to locate the depth and position of the coronoid by sounding with a needle. The incision should be parallel to the fibers of the facial nerve and extend only through the skin. The upper one-quarter should overlie the zygoma, the remainder extending to a point from  $\frac{1}{2}$  to  $\frac{3}{4}$  in. below it. It should not be more than 1 in. in length.

A needle or probe is passed close to the zygoma, down through the masseteric fascia and the masseter muscle until the coronoid is felt. A closed scissor is passed alongside this probe until the point rests against the coronoid. The probe is then withdrawn and, the point of the closed scissors being pressed firmly against the coronoid, the scissors are opened and the fibers of the masseter are split from the zygomatic border downward for an inch.



Fig. 1. The proximal fragment is drawn forward by the pull of the temporal muscle, etc.





Fig. 2. The fragment is held in reduction while a hole is drilled through the coronoid just below the zygoma.

(*Immobilization of the Proximal Fragment in Fracture of the Jaw Above the Angle.* — W. Coughlin)



Fig. 3. The nail is passed straight in through the hole until its head impinges on the outer surface of the zygoma.

An assistant passes his finger into the mouth and makes reduction. He then holds the fragment reduced while a hole is being drilled and a nail is passed. The hole is drilled through the tip of the coronoid as close to the edge of the zygoma as possible.

The nail used is an ordinary wire nail with a thin flat head and about  $1\frac{1}{2}$  in. long. It is passed straight in until its head impinges on the outer surface of the zygoma. When it is properly passed, it effectively prevents the coronoid from rising as it catches at one end under the zygoma and its point comes into contact with the base of the skull. The wound is closed with a figure-of-8 silkworm-gut suture through the masseteric edges and overlying structures.

The jaw is then immobilized. For this kind of fracture the author uses a "closed bite."

The nail is removed after four weeks and comes away very easily.

H. A. MCKNIGHT.

## NECK

**Coudray, G.: Wounds of the Common Carotid and Their Treatment by Ligation** (*Considérations sur les plaies de la carotide primitive et leur traitement par la ligature*). *Presse méd.*, Par., 1920, xxviii, 886.

Wounds of the common carotid in war are almost always immediately fatal either because of the severe hæmorrhage or because of shock.

The author ligated the artery in 3 cases of wounds of this type. Two of the patients recovered. The third case was that of a man who, with help, walked about 100 meters immediately after the injury although an immense jet of blood issued from the wound. Operation was performed at once but death occurred two hours later as the result of the hæmorrhage. The two men who survived had been transported several kilometers before they were operated upon, the smallness of the projectile orifice and the formation of a hæmatoma making this possible.

Ligation of the common carotid may be done below or at the side of the bifurcation. The cranial circulation is re-established by numerous anastomoses effected by the internal and external carotids, etc.

Prior to the recent war the majority of surgeons considered that an associated injury to the internal jugular aggravated an injury of the arterial trunk and increased the risk of gangrene. Experience gained during the war has changed this opinion and many surgeons now recommend ligation of the internal jugular with the artery even if it is normal. In the limbs the ligation of veins diminishes the risks of gangrene.

Coudray believes that ligation of the internal jugular, instead of increasing the frequency of cerebral complications caused by ligation of the common carotid, diminishes the risk of hemiplegia.



It is evident from the reports published that cases in which recovery took place without accident were almost all cases in which both the vein and the artery were injured and ligated.

W. A. BRENNAN.

**Roux-Berger, J. L.: The Surgical Excision of Malignant Tumors of the Carotid Region** (L'exérèse chirurgicale des tumeurs malignes de la région carotidienne). *Presse méd.*, Par., 1920, xxviii, 827.

The malignant growths of the carotid region most commonly encountered are the branchial tumors. The latter, however, and the secondary growths following an epithelioma of the mouth or pharynx are relatively rare. The success of surgical treatment depends on the extent of the growth, the small and movable type of tumor being more favorable as frequently it may be removed in its entirety.

The malignant branchial tumors usually respond very poorly to X-ray and radium treatment. The effect of the rays on the secondary cancerous adenopathies depends on the histologic nature of the growth; some are sensitive and some resistant to the rays. The radio-resistant tumors should be removed if possible and X-ray or radium treatment then instituted. The introduction of radium needles into small tumors is associated with the risk of injury to the jugular vein. In the cases of large tumors this danger is very slight.

The operability of malignant tumors of the carotid is not always easy to determine. Complete fixation is usually due to invasion of the surrounding tissues

and complete extirpation is almost impossible. In the submaxillary and upper cervical regions the tumor is sometimes fixed to the horizontal ramus of the mandible. Complete extirpation in these cases is very difficult and the wound should be exposed to large doses of the X-ray or radium.

In removing malignant tumors of the carotid there is always danger of injuring the internal jugular vein. The tumor is sometimes adherent to the jugular and unless it is removed there is grave danger of leaving tumor cells in the wound. It is often difficult to determine whether or not the tumor is adherent to the jugular, in which case the best procedure is excision of the sternomastoid, the jugular vein, and the tumor in one mass. The growth is thus removed with a portion of the normal tissue surrounding it and the possibility of recurrence is reduced to a minimum. Very little functional disturbance has resulted from the removal of the sternomastoid and the internal jugular vein.

The skin incision is large enough to permit good exposure of the tissues. The sternomastoid is divided at its lower end a short distance above the clavicle, the fascial layers are cut through, and the internal jugular vein is ligated. The whole mass, including the tumor, is then freed from the deeper tissues. This is done by ligating the branches of the jugular vein and by blunt dissection of the main vein from the carotid artery by means of the fingers. When the upper pole is reached, the muscle, fascia, and vein are sectioned and the mass is removed. The skin is then sutured, and if the tumor is ulcerated, drainage is instituted because of the danger of infection.

FRENCH K. HANSEL.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**DuBray, E. S., and Rosson, F. B.: Primary Mesothelioma of the Pleura; A Clinical and Pathologic Contribution to Pleural Malignancy, with Report of a Case.** *Arch. Int. Med.*, 1920, xxvi, 715.

DuBray and Rosson present a report of their study of pleural malignancy. They give a classification of pleural tumors advocated by Guyot and Parcelier and then describe a case in detail, taking up the symptoms, course, physical signs, diagnosis, cytodagnosis, the chemistry of pleural effusions in the diagnosis of malignancy, and the differential diagnosis of pleural growths.

Thirteen cardinal points are made in the paper:

1. Primary malignant pleural tumors are very rare.
2. These tumors constitute a distinct group and present a rather constant pathologic picture.
3. The definite point of origin has not been determined absolutely.
4. It is probable that these tumors are of mesothelial origin and should be designated as "meso-

theliomata" rather than "carcinomata," notwithstanding the fact that most of them have been reported under the term "endothelioma."

5. In the case presented the clinical diagnosis of malignant pleural disease was substantiated by the necropsy findings.

6. Pain in the chest is the earliest and most significant single symptom. It is usually severe and persistent in character and presents the most distressing feature of the disease.

7. The clinical course is of comparatively short duration and is usually afebrile.

8. There is nothing pathognomonic in the physical signs of the disease. A persistent, rapidly re-accumulating, hæmorrhagic pleural fluid is suggestive, and when noted, the possibility of a pleural new-growth should be borne in mind.

9. The clinical picture studied as a whole offers the most valuable and trustworthy evidence.

10. The roentgen-ray examination fails to reveal the exact nature and the site of origin of the disease process in pleural malignancy.

11. Cytodiagnosis and the chemical study of the pleural transudates are of very limited value.



12. When an exhaustive study has failed to establish a diagnosis and pleural malignant disease is suspected, an exploratory thoracotomy is justifiable.

13. The two most important and difficult diseases to exclude in the differential diagnosis are pulmonary tuberculosis with hæmorrhagic pleural effusion and primary malignant disease of the lung or bronchus.

A. R. HOLLENDER.

**Heekes, J. W.: Surgical Emphysema after a Blow on the Neck.** *Brit. M. J.*, 1920, ii, 936.

The patient, a small girl, fell from a short ladder and struck the anterior portion of her neck on a fence a few feet below. No pain was felt except at the site of the impact. Within fifteen minutes the neck began to swell and breathing became difficult. One hour later the entire body was enormously ballooned with surgical emphysema, the skin was intensely reddened, and laryngeal obstruction was evident. An immediate tracheotomy relieved the asphyxia. The patient felt comfortable the following day and the emphysema gradually disappeared, beginning at the extremities. The tracheotomy tube was removed the fourth day and the child left the hospital three weeks after the date of admission.

The point in the respiratory tract from which the air was escaping into the tissues could not be definitely located. A careful physical examination revealed no evidence of pneumothorax, a fracture, a wound, or a bruise which would explain the condition. It is thought the fall occurred in such a manner that the trachea was suddenly pulled upward and that in this way a rent was produced in its lower portion or in one of the bronchi. Tracheotomy was made necessary by occlusion of the larynx caused by the intense emphysema of the cervical tissues. This operation allowed the traumatic opening in the respiratory tract to heal.

T. D. MOORE.

**Porter, M. F.: Tumors of the Breast; Based on a Study of 77 Cases Personally Observed.** *Surg., Gynec. & Obst.*, 1920, xxxi, 584.

Of the 77 cases reviewed, 49 were malignant and 28 benign. The diagnosis was confirmed by laboratory examination in all but 2 cases, those of males who were found to have benign tumors. No composite tumors or sarcomata were found. Scirrhus carcinoma was the most common type. The youngest patient was an unmarried girl 17 years of age. In this case the breast was removed eleven years ago. The patient married and is now living. The oldest patient was 71 years of age. In this case also the tumor was a scirrhus carcinoma. Six years after operation it recurred and death resulted later from metastasis in the stomach. In 11 cases there was, in addition to the tumor, a depression of the nipple, ulcer of the skin, or leakage of the nipples. In 2 cases, one malignant and one benign, the only sign of trouble was leaking nipples. The character of the discharge does not indicate the nature of the condi-

tion but locates it within the duct. Of 33 women who had nursed children, 25 had cancer, while of 42 who had not nursed children the condition developed in only 19. The married state increases the incidence of cancer of the breast only because it increases the incidence of pregnancy. When the laboratory and clinical findings are in conflict the author is guided by the latter.

In 9 of the cases reviewed only the tumor was excised; in 12, only the breast was removed; and in 56 a radical operation was done. The shortest time before a physician was consulted after the condition was first noticed was four days; the longest, thirty-four years. The latter was the case of a woman who stated that she had had a lump in the breast ever since an abscess was lanced. The axillary glands were involved. A radical operation was followed by local recurrence in three years. A second operation was then performed and the patient is now well after three years, but has an irritating skin disease of the arm. Four patients had associated maladies. There was no operative mortality.

In the malignant cases a five-year cure was obtained in 27.2 per cent and a three-year cure in 13.6 per cent. Three patients died of metastasis in the brain. All of the patients with benign tumors were cured except one who reports that she has had a lump in the axilla for six months. The author has not seen her, but assumes that the diagnosis was incorrect.

Logic, animal experiments, and personal experience uphold the opinion that heredity plays a significant part in cancer. In early cases in which the condition is circumscribed, such as probably belong in MacCarty's secondary cytoplasia group, removal of the breast is all that is necessary. Whether radical or not, the type of operation should be made to fit the case—not the case made to fit a particular type of operation. The operative results are improving as patients are consulting the surgeon earlier. This is due in large measure to the work of the American Society for the Control of Cancer. This society should have the hearty support of the profession.

#### TRACHEA AND LUNGS

**Carisi, G.: A Case of Primary Lymphosarcoma of the Right Lung** (Un caso di linfosarcoma primitivo del polmone destro). *Riforma med.*, 1920, xxxvi, 1124.

Primary lymphosarcoma of the lung is not frequently seen in medical practice. The author reports the case of a man 21 years of age who entered the hospital with the diagnosis of empyema. His illness began about three months before with a dry cough. Later there was yellowish purulent sputum. Complaint was made of loss of weight, lancinating pain at the base of the right lung which radiated to the epigastrium, and diffuse oedema of the right chest wall.

Exploratory punctures being negative, the author diagnosed the condition as a neoformation primary



in the lower half of the right hemithorax. He was uncertain, however, whether this growth was a sarcoma or a carcinoma. Death resulted in a short time. The autopsy showed that the tumor was a pulmonary sarcoma the size of a fetal head in the lower lobe. The right lung was free but the glands of the right hilum were invaded. On microscopic examination the tumor was found to be a round-celled polynuclear lymphosarcoma. Sarcoma was not discovered in any other organ.

W. A. BRENNAN.

### PHARYNX AND ŒSOPHAGUS

**Austoni, A.: A Further Contribution to the Treatment of Severe Cicatricial Stenoses of the Œsophagus** (Ulteriore contributo all' indirizzo di cura delle stenose cicatriziale di alto grado dell' esophago). *Arch. ital. di chir.*, 1920, ii, 435.

A short time ago Austoni reported the favorable results obtained in 4 cases of severe cicatricial stenosis of the Œsophagus by means of progressive dilatation. On the basis of these and several new cases which he has treated he arrives at the following conclusions:

1. Cases of erosion by caustics should be seen by a surgeon at once because of the more or less immediate consequences of the destructive lesions in the Œsophageal walls.

2. When the destructive lesion of the walls is extensive and deep, immediate intubation is indicated in order to prevent the formation of a severe stenosis by cicatricial retraction. For this intubation the retrograde route should be employed.

3. An early operation is always indicated in cicatricial stenosis as the probability that good results will be obtained is greater when the cicatricial tissue is newly formed.

4. Absolutely impermeable cicatricial Œsophageal stenoses are extremely rare. All stenoses which are permeable by even a very fine sound, however old, may always be cured by dilatation. While this procedure is associated with minor dangers, it is more successful than any other.

5. The first step in the dilating process consists of the passage of a bougie to prepare the way and serve as a guide for further manœuvres. This bougie may be passed by way of the mouth or by the retrograde route through a gastric fistula. The first route is recommended for cases of stenosis situated in the cervical and upper thoracic tracts; the second, for those in which the stenosis is not easily reached from above without difficulty and danger.

6. Œsophagoscopy is of the greatest value in facilitating intubation. The methods usually employed to overcome urethral strictures are also of value. Gastric endoscopy with indirect vision is recommended for retrograde intubation. The discovery of the cardia will be facilitated if the patient swallows during the examination or ingests a little milk.

7. The best method of treating cicatricial Œsophageal stenosis is progressive dilatation by repeated intubations or the insertion of a sound for one or two hours either through the mouth with the aid of the Œsophagoscope or by the retrograde route with the aid of a guiding thread.

8. The duration of the treatment depends upon the degree, extent, and age of the stenosis and is shorter when the stenosis is recent. In cases of long-standing and great severity treatment is usually necessary for about four months. The dilatation should then be repeated monthly for a year.

9. The hypodermic injection of fibrolysin facilitates the treatment and hastens recovery.

W. A. BRENNAN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

**Svartz, N., and Hansen, R.: Diffuse Purulent Peritonitis without Perforation in Typhoid Fever** (Péritonite purulente diffuse sans perforation dans la fièvre typhoïde). *Acta med. Scand.*, 1920, liv, 97.

In the case reported the purulent peritonitis was due to propagation of the inflammation through the intestinal walls without penetration of infected material into the abdominal cavity. This was evident from the absence of intestinal perforation, the fact that at operation no free gas was found in the abdomen, the exudate did not contain colon bacilli, the ileum showed inflammatory changes, and typhoid bacilli were found in the exudate from the ileum.

Between 40 to 50 cases of peritonitis caused by propagation have been reported in the literature. A little less than one-third were cases of fibrinous

peritonitis. Ten were purulent cases and the remainder cases of serofibrinous peritonitis. Twenty-five per cent of the patients recovered after operation. In 4 cases the presence of the typhoid bacillus in the exudate was demonstrated.

The authors' patient was a woman 26 years of age. On the thirty-fourth day of her illness she was operated upon for a supposed intestinal perforation due to typhoid fever. Twenty-five days after the first operation a second operation was done to drain a subphrenic abscess. Death occurred about seven weeks later from bronchopneumonia.

W. A. BRENNAN.

**Andrews, E. A.: Large Strangulated Umbilical Hernia.** *Surg. Clin. Chicago*, 1920, iv, 1247.

The author describes briefly a case of sudden strangulation of an umbilical hernia which had been present for fifteen years without producing symptoms. The patient, an extremely obese colored



woman 45 years of age, was apparently suffering acute pain and in a marked degree of shock with a temperature of 100 degrees F., pulse 120, and respiration, 30, short and catchy. The operation revealed a multilocular sac. The adherent omentum was resected and the hernia closed. Recovery followed.

The author describes the operation and discusses the after-treatment of patients who are markedly obese.

E. C. ROBITSHEK.

### GASTRO-INTESTINAL TRACT

**Kelling, G.:** *The Treatment of Dangerous Gastro-Intestinal Hæmorrhage* (Beitrag zur Behandlung lebensgefährlicher Magendarmblutungen). *Muenchen. med. Wchnschr.*, 1920, LXVII, 1198.

In the author's opinion the prognosis of severe gastro-intestinal hæmorrhage is too often regarded as favorable. Hæmorrhage from a callous ulcer is especially dangerous because the large eroded vessels cannot contract. In the author's cases the mortality was 12 per cent. Kelling believes that one-third of callous ulcers may be diagnosed by palpation. Other factors aiding in the diagnosis are advanced age, a history of long-standing ailment, and poor nutrition.

As in all other types of hæmorrhage, men are in greater danger than women. If a callous ulcer is palpable the prognosis as regards hæmorrhage depends also upon whether it is movable or not. If it is movable it is probably not adherent to neighboring organs and the prognosis is more favorable. The prospect of cure is better also when the ulcer is situated in the pylorus or duodenum rather than in the fundus, as in the fundus a large vessel such as the left coronary artery may be eroded. If the ulcer is not movable it is probably adherent to the pancreas and hæmorrhage is very dangerous as large vessels may be involved. Ulcer penetration into the liver is much less serious.

The usual treatment consists in placing the organs at rest—rest in bed, narcotics, and no food. To increase the coagulation of the blood, gelatine, calcium salts, coagulants, and intravenous injections of concentrated salt solutions are given. All these remedies, however, are very slow and transitory in their effects and will not stop a severe hæmorrhage from a large vessel. Without surgical intervention we are therefore almost powerless and must depend on nature to stop the hæmorrhage by lowering the blood pressure and increasing the rapidity of coagulation.

Regarding the quantity of blood flowing into the stomach and intestine we are in entire ignorance; hæmorrhage may be fatal without causing hæmatemesis or the appearance of blood in the stool. The loss of one-third of the total quantity of blood is tolerated fairly well but the loss of one-half is fatal.

In cases of repeated hæmorrhages, renewed syncope, weakness of the pulse, and a hæmoglobin content between 30 and 40 per cent, more active

treatment is necessary. In such cases the author forces the abdominal walls against the spine so that the lower end of the duodenum is compressed. By this procedure the blood is prevented from entering the bowel. The compression is effected by laying a roll of cotton tightly across the umbilical line, fastening it with adhesive, and placing upon it a 10-lb. sand bag. The author left this pad in place in 3 cases for thirty-six hours and in 1 case for forty-eight hours without producing damage to the bowel wall. When the stomach is very low and the ulcer is situated to the right of the midline, the pylorus also is shut off and the tamponade is all the more effective. This method has one danger in that when the ulcer is very easily torn the stomach or intestine, dilated with blood, may be perforated. Therefore the procedure should be reserved for serious cases.

If the bleeding ulcer lies to the left of the median line, compression is not sufficient; the entire stomach fills with blood and when there is dilation the amount of blood lost may be considerable. For such cases the author recommends filling the stomach with air through a small Nélaton catheter introduced through the nose. To the end of the catheter a T-piece is fastened, one arm of which is attached to the pump with which the stomach is filled with air and the other arm brought into a vessel filled with water to a depth of 15 cm. The stomach is filled with air for ten minutes, the arm of the T-piece which extends into the water preventing a greater pressure than 18 cm. of water. This pressure is easily tolerated and will not cause perforation of the stomach. In some cases the pressure may be increased from 3 to 5 cm. of water. This air pressure acts like a tampon. If it does not stop the hæmorrhage surgical interference becomes necessary. Under ordinary conditions resection of the ulcer is indicated. In some cases ligation of the bleeding vessels is sufficient, but if this is impossible, suture of a portion of the omentum over the bleeding area may be done. Only then is gastro-enterostomy indicated.

In extreme and sudden cases the fastening of a towel firmly around the stomach, the filling of the colon with air, and the application of a sand bag to the abdomen may aid in effecting hæmostasis. By these methods the stomach is compressed. The body should be in a horizontal position with the legs raised so that the abdominal organs fall toward the chest and in this way increase the pressure upon the stomach.

GANGE (Z).

**Eggleston, E. L.:** *A Critical Review of 500 Cases of Gastric and Duodenal Ulcer.* *J. Am. M. Ass.*, 1920, LXXV, 1542.

In this article Eggleston reviews 500 carefully selected cases of gastric and duodenal ulcer. Only those are considered in which the diagnosis was certain and a careful study was made in collaboration with a roentgenologist. In every case more than one year has elapsed since treatment was discontinued.



The author summarizes his paper as follows:

1. The diagnosis of peptic ulcer is not as easy as it is believed to be by a great many medical men. There are a number of abdominal disturbances which disturb the function of the stomach and its chemistry reflexly and cause symptoms closely simulating those of duodenal ulcer.

2. Gastric ulcer is not as common as duodenal ulcer. In the series of cases reviewed 415 of the ulcers were duodenal and 85 gastric in origin. Other statistics differ to some extent, but all show that duodenal ulcer is more frequent than gastric ulcer.

3. More than 10 per cent of these ulcers were designated as "penetrating ulcers." In reality these are ulcers which have burrowed through the posterior wall of the stomach into the neighboring tissue, but have been well walled off so that the escape of gastric and duodenal contents into the abdominal cavity has been prevented. The penetrating ulcer is distinguished clinically by the greater severity of pain, greater local tenderness, and the absence of relief after the ingestion of food or alkalies. Whenever the patient complained of a persistent boring and piercing pain a penetrating ulcer was reported by the roentgenologist and corroborated by the surgeon.

4. A history of hæmorrhage was obtained in 19 per cent of the total number of cases. This does not include cases showing only a slight trace of blood in the stool or vomitus as a small amount of blood in the fæces may be due to a lesion of the lower colon, and a small amount in the vomitus, to the trauma of vomiting or lavage. Hæmorrhage is the complication which is most alarming to the patient and annoying to the physician, but is rarely fatal. In the cases reviewed and all suggestive cases reported during a period of twenty years there has been only 1 case of death from this cause. The severe effects of hæmorrhage are readily relieved by transfusion. In cases of repeated hæmorrhage a gastro-enterostomy should be performed and the ulcer excised or cauterized and infolded.

5. After a definite diagnosis as to the type of ulcer, the chronicity of the condition, etc., there is no organic trouble which responds so readily to organic treatment as peptic ulcer. Seventy-five per cent of the patients treated medically have had no relapse of symptoms in three years. Eighty of these patients were well adapted for medical treatment in that they were well nourished and had no pyloric stenosis or symptoms of threatened perforation. A lapse of months or a year will prove only that the ulcer is healed, for in many cases the condition recurs after the symptoms have been absent for six months.

6. Medical treatment, especially in cases of gastric ulcer, consists of rest in bed, small and frequent feedings, and the administration of moderate amounts of a mixture of sodium bicarbonate, bismuth subcarbonate, and magnesium oxide. An alkaline lavage just before the patient retires will

give relief. An important cause of failure in medical treatment is carelessness with regard to the diet. Einhorn's method of tube feeding has proved very satisfactory. Often in cases of multiple ulcer a tube is introduced into the proximal loop of the jejunum and the patient is fed by this route for several months.

7. Forty-seven of the patients included in the group reviewed were subjected to surgery and 21 have never had any digestive symptoms since, while 17 experienced recurrence of symptoms. Three died and the remainder cannot be traced. In all cases of duodenal ulcer in which there is marked pyloric stenosis which fails to yield promptly to medical treatment and those in which there have been repeated hæmorrhages or penetrating ulcers surgical interference is indicated but the patient should be made to understand that an absolute cure cannot be guaranteed.

8. Hyperchlorhydria was found in 72 per cent of the cases and hypochlorhydria in 11 per cent. Fourteen per cent were normal and 2 per cent showed an achylia. The analysis of the stomach contents is of value in determining the treatment and therefore is always justifiable.

9. In all cases the mortality was only 2.2 per cent, a rather significant finding which should lead us to conclude that the prognosis of peptic ulcer is good. Less than 2 per cent of the gastric ulcers developed malignancy; hence there is little danger of carcinoma. Hæmorrhage has little or no danger under the present methods of treatment.

H. K. BEGG.

**Ivy, A. C.: Studies on Gastric and Duodenal Ulcer.**  
*J. Am. M. Ass.*, 1920, lxxv, 1540.

The author in this article reports upon:

1. The effect of prolonged exposure of the entire mucous membrane of the pyloric antrum to the exterior.

2. The effect of manipulation and infection of an acute ulcer on its healing time.

3. The occurrence of duodenal ulcer following gastroduodenostomy on the dog.

The results of these observations may be summarized as follows:

1. The gross appearance of the mucous membrane after it has been exposed from six to ten months is normal in every respect. Microscopic examination of four pouches which had been made for from six to ten months disclosed no changes. These findings indicate that an altered anatomical and physiological position of the stomach is not the cause of pathologic disturbance.

2. Normally the healing time of an acute ulcer from 1 to 1½ in. in diameter in the mucosa of the pyloric antrum of an intact stomach varies from twelve to eighteen days. The healing time of a similar ulcer in the exposed mucosa of the pyloric pouch varies from fifteen to twenty days. When these ulcers are manipulated twice daily by rubbing the edges with cotton or bread crumbs until con-



gestion and bleeding occur the healing time varies from thirty to fifty days and scar formation is very marked. The delay is similar to that caused in partial pyloric stenosis with acute experimental ulcer. The manipulation delays the proliferation of the mucosal cells at the edge of the ulcer and prevents them from getting a foothold on the base. In other experiments, injections of pus and bacteria were given into the ulcer area in addition to the manipulation. The healing time varied from thirty-three to forty-seven days, a fact which showed that healing was not delayed or influenced by exposure to infection.

3. When gastroduodenostomy was done upon 40 dogs, 5 duodenal ulcers occurred, 3 of the acute perforating type and 2 of the chronic type. These ulcers developed along the line of the clamps and not at the suture line, a fact which suggests that the use of gastro-enterostomy clamps may be injudicious

H. K. BEGG.

**Lecène, P.: End-Results of Operations for Mesogastric Ulcers** (Quelques résultats éloignés d'interventions pour ulcères méso-gastriques). *J. de chir.*, 1920, xvii, 2.

Lecène gives the clinical histories of 5 cases operated upon for mesogastric ulcer with more or less marked stenosis. In 3 of these cases mesogastric resection was done, and in 2, a gastrogastrostomy. The time since the operation varies from six to ten years.

The 5 cases show that the results of operation for mesogastric ulcers are very good. Segmental resection of the portion of the stomach showing an ulcer which causes biloculation is evidently the operation of choice as it makes possible the removal of the ulcer and the re-establishment of the stomach in almost its normal form. This type of operation, however, is not always practicable; it is dangerous, for example, when a cicatricial ulcer is intimately fixed to the pancreas and the patient is very anæmic. For such difficult cases, therefore, Lecène prefers gastrogastrostomy done according to Finney's technique. This procedure leaves the cicatricial ulcer *in situ*, but makes possible the formation of a large anastomotic opening and extensive reunion of the two gastric pockets.

The end-results of gastrogastrostomy, however, are not as good as those of segmental resection; the ulcer persists, and although healed, it is still a source of trouble.

Gastro-enterostomy has been proved an excellent operation in cases of fibrous stenosis of the pylorus or juxta-pyloric ulcers with stenosis, but is very mediocre when an ulcer is situated in the body of the stomach. In cases of close fibrous mesogastric stenosis a gastro-enterostomy done on the cardiac pocket (or even on both pockets) is much less physiological than a gastrogastrostomy and the results are poor. Therefore, since 1910 Lecène has done only resections or gastrogastrostomies in cases of mesogastric ulcers.

W. A. BRENNAN.

**Duggan, N.: Volvulus of the Small Intestine Following Ileocolostomy.** *Brit. M. J.*, 1920, ii, 889.

The patient, a woman 62 years of age, had suffered for three years from progressive loss of weight, increasing constipation, frequent attacks of severe indigestion, and abdominal pain. She was leading a semi-invalid life and appeared thin and ill. Laparotomy revealed visceroptosis and a thin and atrophic colon. Ileocolostomy was performed by lateral anastomosis of the closed and divided lower end of the ileum to the pelvic colon. The patient made a good recovery; the bowels acted freely and pain and indigestion were relieved. She remained in improved health for about six and one-half months but was then seized with a sudden acute abdominal pain which gradually became worse. The next day the abdomen was slightly distended and tender, but not rigid, the tongue dry and furred, and the pulse feeble and irregular. Flatus was passed but no feces. The condition was evidently obstruction, but because of the patient's poor general condition palliative measures were tried first. No results followed a large turpentine enema, and on the third day from the onset vomiting set in.

Operation was then performed under ether preceded by the administration of morphine and atrophine. Two pints of saline were given intravenously and the abdomen was opened by a low median incision. A twisted mass of black and gangrenous intestine, the size of a foetal head, was found in the pelvis. This proved to be a volvulus of the lower end of the ileum caused by a short, cord-like adhesion between the fold of mesentery. The peritoneal cavity contained a quantity of turbid fluid with a strong faecal odor. As the intestine involved was already gangrenous, the portion above and below was divided between clamps and a wedge of mesentery was resected. The gangrenous portion broke and distributed its contents in the wound. The cut ends of the intestine were united by end-to-end anastomosis with two layers of catgut sutures and the wound was closed with through-and-through silkworm sutures. The patient made an uneventful recovery.

The second week following operation a troublesome diarrhoea was arrested by the administration of a mixture of hydrochloric acid and malt extract. The wound suppurated only slightly and the patient was able to be about in one month. As the gap between the mesentery of the ileum and pelvic colon had been closed at the first operation and had remained closed, there was no strangulation due to the intestine's slipping through. The adhesions giving rise to the volvulus were no doubt a sequel of the first operation.

K. M. KOONS.

**Basile, G.: Simple Ulcer of the Intestine** (*L'ulcus simplex dell' intestine*). *Policlin.*, Roma, 1920, xxvii, sez. prat., 1410.

Simple ulcer of the intestinal tract is rarely mentioned in text-books. In 1919 Leotta was able to collect only 22 cases from the literature. As a



rule the lesion is discovered at autopsy or during a surgical operation.

A case observed by the author in 1906 was that of a man 45 years of age who came to the hospital showing the syndrome of diffuse peritonitis which was believed to have had its origin in the appendix. A laparotomy was done but the operation could not be completed because of the patient's condition. Death occurred a few hours later. Autopsy showed the appendix to be normal and very small. On the ileum, about 20 cm. from the ileocaecal valve, were two perforated ulcers the size of a cent.

There was no evidence to show that the ulcers were of tubercular origin or due to trauma or disturbance of the circulation, or any infective or toxic process. Macroscopically they were found to be round and raised and the surrounding wall was intact. Phlogosis and vascular alterations at the margins of the ulcerations were absent. Basile therefore concluded that this was a case of true simple ulcer of the small intestine. In its macroscopic characteristics it resembled the round gastric ulcer and ulcer of the duodenum. W. A. BRENNAN.

**Bancroft, F. W.: Acute Appendicitis: A Review of 584 Consecutive Cases.** *J. Am. M. Ass.*, 1920, lxxv, 1635.

This is an analytical study of the mortality and complications of 584 consecutive cases of acute appendicitis with special reference to the late results in the cases of 500 patients who were followed for from three months to four years after they left the hospital. The author's chief purpose is to emphasize the importance of early operation and to show the fallacy of the old precept that if operation is not performed at the onset of the attack it is wise to wait until the formation of an abscess. Thirty-five per cent of the series of cases reviewed were late cases in which either a localized abscess or diffuse spreading peritonitis had developed before the patient's admission to the hospital.

The mortality was no lower in the abscess cases than in those of appendicitis with free fluid, and in the former the secondary complications and late sequelæ were greatly increased. The outlook is therefore more favorable in early cases in which closure without drainage is possible. This is evidenced by the fact that in cases without drainage the mortality was 0.83 per cent and in drained cases, 6.8 per cent.

Secondary abscess developed in 6.7 per cent of the abscess cases and 7.8 per cent of the cases with fluid, but one-half of the latter were not drained. This fact and the fact that 2 deaths (8 per cent of the total mortality) might have been prevented by drainage emphasizes the old dictum "When in doubt, drain." Hernia occurred in 18.7 per cent of the abscess cases and 5.5 per cent of the cases with fluid. In addition, faecal fistula developed in 11.2 per cent and ileus developed in 1.5 per cent of the cases of abscess while none of the cases with fluid showed these complications.

Of the undrained cases, 1.9 per cent, and of the drained cases, 15 per cent developed postoperative hernia. Prolonged drainage seemed to be the most important factor favoring this sequela. Poor musculature and low resistance appeared to be of importance also as the condition was more frequent in infants and after the fortieth year of age.

Of the 584 patients with acute appendicitis, 63.7 per cent were males, while of 446 patients with chronic appendicitis 61.9 per cent were females. Therefore, it appears either that chronic appendicitis does not become acute in women or that the diagnosis of right lower quadrant pain in women is frequently incorrect.

In the cases operated upon early the period of disability was much shorter. Therefore, in view of the fact that delay increases the mortality, the post-operative complications, and the period of disability, the author concludes that operation should be performed as soon as the diagnosis is made.

H. J. VANDEN BERG.

**Marulanda, A. E.: Trichocephalus as a Cause of Frequent Chronic Appendicitis in Warm Countries** (Los tricocefalos como causa de la frecuencia de la appendicitis cronica en las tierras calientes). *Reperi. de med. y ciruj.*, 1920, xii, 82.

The trichocephali are thought to be responsible for the greater frequency of chronic appendicitis in tropical countries than in colder climates. Of 20 cases of appendectomy for chronic appendicitis (in 14 of which the operation was performed only for the appendiceal condition and in 6 of which it was done in the course of some other pelvic operation) trichocephali were found in 16. The number in any one case varied greatly, but in 3 cases there were 6, 8 and 10 parasites respectively. The living parasites are anchored deeply in the mucous folds of the appendix by the sharp-pointed extremity while the large clubbed end lies free within the lumen of the appendix.

It is more probable that the trichocephalus is the provocative cause of the appendiceal colic than that the inflammation precedes and facilitates the entrance of the parasite. The anchoring extremity of the trichocephalus acts as a mechanical irritant producing many abrasions of the mucosa which may result in infection. The free clubbed extremity may also obstruct the lumen, thus causing stagnation quite similar to that due to a faecal concretion. It is also very probable that the movement of the free extremities in an appendix chronically inflamed is responsible for the pain.

W. R. MEEKER.

**Henes, E., Jr.: The Surgical Treatment of Typhoid Carriers.** *J. Am. M. Ass.*, 1920, lxxv, 1771.

Henes is of the opinion that recent work on the detection of chronic carriers of bacillus typhosus has eliminated all of the carriers except those harboring the infection in the gall-bladder and cystic duct. "Kidney carriers" he believes are exceedingly rare, the condition developing only when the kidney



has been previously involved in some other pathologic process. Apparently, however, this is not true as regards "gall-bladder carriers."

In the summer of 1918 the author was able to study typhoid fever particularly with respect to complicating cholecystitis and continued infectiousness in 183 patients who had contracted the condition at the detention camp for interned alien enemy Germans at Hot Springs, N. C., and were sent to U. S. Army General Hospital No. 12 at Biltmore, N. C. His careful and detailed studies seemed to justify the following conclusions:

1. So-called "urinary carriers" are exceedingly rare, and when the condition does occur, pre-existing pathologic lesions of one or both kidneys are responsible for the continued infectiousness of the urine.

2. So-called "intestinal carriers," that is, those in whom cultures from the faeces are persistently positive and repeated cultures from the duodenal contents are persistently negative probably do not exist.

3. Persistent infectiousness from the bowel is directly attributable to an infected gall-bladder.

4. All patients who have suffered from a complicating cholecystitis in the course of typhoid fever should be carefully and repeatedly examined in order that continued infectiousness of gall-bladder origin may be determined.

5. Nearly all patients with complicating cholecystitis will develop cholelithiasis unless operated upon early.

6. Persons who continue to give positive duodenal or faecal cultures six months after the onset of the disease should be considered persistent carriers.

7. A positive duodenal culture of bacillus typhosus indicates infection from the faeces, and the bacilli will invariably be found in the stool if the proper bacteriological technique is employed.

8. Postoperative cultures from the gall-bladder in the cases of patients who previously showed a positive duodenal culture will usually be positive for typhoid bacilli.

9. Cultures from recently formed stones (crushed) found in a gall-bladder obtained from a case in which a positive duodenal culture was obtained previously will usually be positive for typhoid bacilli.

10. Biliary calculi usually form quickly (three months) after a complicating or post-typhoid cholecystitis.

The author presents seven cases to show the efficacy of the surgical treatment of typhoid carriers and to confirm the observations of Nichols, Simmons and Stimmel. His conclusions are given briefly as follows:

1. Cultural examinations of the duodenal contents are indicated in all cases during convalescence from typhoid fever.

2. Cholecystitis is a frequent complication of typhoid fever.

3. Persistent infectiousness following typhoid fever is usually the result of cholecystitis.

4. A gall-bladder may continue to be infectious without the usual manifestations of a cholecystitis.

5. Cholecystectomy with complete excision of the cystic duct will cure the great majority of typhoid carriers.

6. Radical (surgical) treatment of complicating cholecystitis is to be considered. The likelihood of a carrier state is thereby greatly diminished and the probability of future gall-bladder trouble is obviated.

7. Examination of the duodenal contents should imply an examination of the contents periodically aspirated and cultivated during the course of twelve or twenty-four hours. Three consecutive negative examinations made at weekly intervals indicate cure of persistent infectiousness.

8. Typhoid fever is a preventable disease. The incidence of the infection has been astoundingly decreased by the use of prophylactic inoculation, and more can be accomplished along these lines. Endemic typhoid, however, will continue to exist just as long as we fail to detect persistent infectiousness. The research at Biltmore showed conclusively that the gall-bladder is the seat of continued infectiousness, and this infectiousness can be detected definitely by an intelligent cultural examination of the duodenal contents. No case of typhoid fever is to be judged free from infectiousness until it can be conclusively shown that the gall-bladder and its contents are free from typhoid bacilli. In the event of persistent infectiousness, the indication is definite and absolute for cholecystectomy.

E. C. ROBITSHEK.

**Struthers, J. E.: Multiple Polyposis of the Intestinal Tract.** *Ann. Surg.*, 1920, lxxii, 649.

A careful review of the literature on intestinal polyposis is presented and 39 cases of this disease observed in the Mayo Clinic from January, 1911, to February, 1920, are studied with regard to the etiology, pathology, symptoms, and other important data.

Multiple polyposis of the intestinal tract is a serious disease of obscure origin. Although persons of any age from adolescence to physiological decline are affected, 37.5 per cent of the cases are those of persons between 19 and 30 years of age. The number of cases decreases progressively with the advance of years. The disease occurs more frequently in males than in females, the sex ratio being 2.9 to 1.0. In the cases reviewed the duration of symptoms ranged from three weeks to thirty-four years; 66 per cent of the patients had had symptoms for three years or more, while 54 per cent had had symptoms for five years or more.

The principal symptoms are a sense of weight in the rectum, tenesmus, bleeding, diarrhoea, vague abdominal pain, colics of obscure origin, partial obstruction, and essential hæmorrhage. Essential hæmorrhage is a nearly pathognomonic sign of this



lesion. The rectum, the sigmoid, and the splenic and hepatic flexures are most frequently involved. Thirty-four of the 39 patients had periods of diarrhoea and 31 had abdominal pain at some time during the course of the disease. Rectal pain, bleeding, loss of weight, etc. were variable and at times due in part to coincident lesions such as gastric ulcer, duodenal ulcer, and hæmorrhoids. All except 2 patients had a loss of weight ranging from 10 to 60 lb. A study of the blood in 29 cases showed a hæmoglobin content below 50 per cent in only one-fourth of the cases. Examination of the stools also contributed very little to the study. The value of proctoscopic examination is evidenced by the positive findings in 28 cases.

Twenty-two patients were treated surgically by various types of operation, including the Brown operation, ileocolostomy, colectomy, ileosigmoidostomy, the Mikulicz operation, the two-stage Kraske operation, appendicostomy, and the Desquin-Mixter operation. Nineteen of the patients treated surgically have been accounted for; the mortality among these was 47.34 per cent. Twelve of 14 patients treated medically were heard from; the mortality was 25 per cent. In comparing these two groups of statistics it should be remembered that medical treatment afforded no possible hope for recovery in the cases of patients who came to operation and that surgery gave them the only chance for life.

The findings at operation and necropsy indicate that multiple polyposis is a diffuse condition of the colon. The findings of Hewitt and Howard, that in the rectum polypi are situated along the side of the intestinal wall while higher up in the colon they are situated along the line of mesenteric attachment, have not been confirmed in the Mayo Clinic.

Schwab's theory of chronic constipation in the etiology of the lesion is hardly tenable in view of the prevalence of polyposis in males and the high incidence of chronic constipation in females. Proctoscopic examination of patients and microscopic examination of specimens removed at operation frequently show ulceration associated with polyposis and tend to confirm Rokitsansky's theory that intestinal polypi arise from the margins of dysenteric ulcers.

According to the pathology, intestinal neoplasms are classified as papillomata, polypi, and adenomata, the latter predominating (40 per cent). In a large percentage of cases there is a progressive general colitis which forms a number of undermining coalescing ulcers so that large areas become involved. Portions of the mucosa and submucosa supplied by primary arterial branches are preserved, and as healing takes place the irregular margins of those elevations are smoothed off and remain as polypoid projections. Subsequent cicatrization may occlude the tubules while continued functioning of the secreting cells results in small retention cysts. Friction and traction on these elevated areas cause the formation of pedicles. Further inflammatory or

degenerative changes may occur. Adenomata do not become malignant more frequently than polypi or papillomata. The most marked involvement is found in the chronic cases and, conversely, the area involved is most localized in the acute cases.

J. W. PANGBURN.

McKay, H. S.: *Vesico-Intestinal Fistulae*. *J. Missouri M. Ass.*, 1920, xvii, 489.

Vesico-intestinal fistula is an uncommon condition, only 342 cases having been reported in the literature. The causes giving rise to such fistulae most commonly occur in the intestinal tract. The chief etiological factors are malignant growths and tuberculosis. In rare cases rectal abscess, rectal ulceration, disease of the appendix, syphilis, or actinomycosis is responsible. Less often the causative lesions are found in the bladder. An indirect factor may be abscess of the pelvis or trauma.

In the collected cases the opening in the intestinal canal was found most frequently in the rectum, and next most frequently, in the sigmoid. In the remaining cases it was discovered in the small intestine and cæcum. The fistulous tract may be direct or extend through a sinus.

As a rule the diagnosis may be made easily by means of the cystoscope, sigmoidoscope, and roentgen ray.

The cardinal symptoms are the passage of gas and faeces through the urethra and the passage of urine through the rectum. After perforation has occurred the symptoms are usually aggravated; urination then becomes painful and eventually the kidneys are infected. The most annoying single symptom is pneumaturia.

The prognosis depends largely on the nature of the primary lesion and is most unfavorable when carcinoma or tuberculosis is the cause. When trauma or inflammatory disease is the etiological factor the prospect of cure is more favorable as these cases may be subjected to operative treatment.

The form of treatment also depends on the cause. In cases of fistula due to trauma, abscess, or disease of the appendix, operation is especially satisfactory. In some instances in which the condition is due to tuberculosis or syphilis spontaneous healing has occurred under treatment.

R. R. MUSTELL.

Lane, W. A.: *Cancer of the Colon: Its Causation and Treatment*. *Lancet*, 1920, cxcix, 1184.

Before considering the operative treatment of cancer of the colon Lane puts forward his views with regard to the conditions which antedate and produce cancer of the large bowel. An understanding of these factors may lead to the control or prevention of the development of cancer.

The causal factor of cancer in any part of the body is traumatism in the widest sense of the word. A second factor is degenerative change in the body tissues, the result of the products of intestinal auto-intoxication or syphilis or both. The third, or unknown factor, is designated 'X' and does not act



except in the presence of the results of traumatism and degenerative factors. It is distinctly probable that the factor X may be overcome by removing the traumatic and toxic factors on which it depends. Thus, by proper legislation, the incidence of syphilis could be reduced greatly and its effects could be diminished by early and efficient treatment.

The gastro-intestinal tract affords an excellent illustration of the manner in which traumatism produces ulceration and cancer as the tongue, the pharynx, the œsophagus, the lesser curvature of the stomach, and the immediate vicinity of the pylorus are exposed to constant injury either in the form of impact or strain; the same principle applies to the incidence of cancer of the colon.

The mechanical factor is intimately bound up with the toxic factor in the condition of chronic intestinal stasis. Lane raises the question as to whether anything can be learned from the immunity of the duodenum and small intestine to cancer. In the duodenum especially the several factors that produce cancer elsewhere in the intestinal tract are present; namely, the mechanical, the toxic, and presumably the factor X. That X is unable to influence an ulcer of the duodenum cannot be due to the presence of bile or pancreatic juice since cancer develops in the ducts of the organs secreting these juices. Mutch observes that the area of freedom from the effects of the factor X corresponds to the distribution of enterokinase, the ferment of ferments which activates the precursor of trypsin.

In chronic intestinal stasis there are two distinct factors: the primary, which is solely mechanical, and the secondary, which is essentially toxic and results from the action of the mechanical or traumatic factor. The author illustrates the variation in the behavior of the individual to stasis by describing this condition in a patient with little vitality and in one with great vitality. In persons with little vitality there is no attempt to form resistant or retaining membranes; the pelvic colon is elongated, the iliac, descending, and transverse segments become elongated, tortuous, and prolapsed, and the cæcum and ascending colon dilate and prolapse. The marked feature is the absence of any acquired membrane or crystallization of a line of force tending to obviate or control the prolapse. The intestines are dilated and their walls are thin and flaccid. The pylorus is but moderately spastic and the stomach is dilated, with little or no hypertrophy of its walls; hence the failure of gastro-enterostomy to relieve this condition. In this type auto-intoxication is the marked feature, and abdominal symptoms, except for constipation and flatulence, are absent or of minor importance unless there is inflammation of the mucous membrane of the cæcum, ascending colon, and part of the transverse colon. In this event there may be associated spasm of the muscular wall which reduces the lumen and limits the passage of the contents. The treatment of choice for this condition is colectomy. Hemi-colectomy or suspension does not correct the cause of the disease.

Lane removes the large bowel to the level of the pelvic colon and inserts the extremity of the ileum directly into the lower limit of the pelvic colon.

Stasis in persons with great vitality presents symptoms which are chiefly mechanical. The delay in the passage of the colonic contents is met by the formation of bands and membranes in certain definitely localized situations. The first kink to appear is at the juncture of the iliac and pelvic segments. Secondary to the obstruction exerted by this kink is the development of bands in the peritoneum on the outer aspect of the descending colon followed by the formation of bands at the splenic flexure. Bands from the gall-bladder, liver, pylorus, and duodenum attach to the hepatic flexure; similar bands develop from the peritoneal reflection from the cæcum at the level of the iliac crest; and a controlling appendix or ileal kink is frequently present. The pylorus is hard and contracted, while the stomach is usually somewhat dilated and its musculature is hypertrophied. An ulcer may be present at the pylorus or on the lesser curvature. As there is no ulceration of the mucous membrane of the colon, the contents accumulate behind the several acquired points of obstruction.

Diverticula, consisting of hernial protrusions of mucous membrane through the muscle coat, may occur in the colon proximal to the obstruction. Fæcal concretions may form, infection develop, and subsequently cancerous foci may appear in the bowel damaged by traumatism.

Of great importance is the fact that patients with little vitality do not acquire cancer of the colon any more than cancer of the stomach or œsophagus, while those with high vitality are very liable to the formation of cancer at any of the points of obstruction produced by acquired bands, in the situation of the muscle at the juncture of the pelvic colon and rectum to which W. J. Mayo has called attention, and about the sphincter ani.

The explanation of the different frequency of cancer in the two types is obvious. In the first type the elongated bowel with feeble muscles, inflamed mucous membrane, and scanty contents exerts but little effect at the juncture of elongated loops. In the second group the bowel is not elongated, the musculature is hypertrophied, fæces are abundant, and obstruction is acute and well defined. The auto-intoxication in the first type of case causes degenerative changes in the breasts, uterus, ovaries, and other organs, and renders them much more liable to cancer than those of the second group.

Mechanical causal factors determining the development of cancer of the colon are: (1) the constriction of the lumen of the bowel, (2) the thrust of the hypertrophied muscle coat proximal to the obstruction, and (3) increasing desiccation of the fæces.

Stasis can be prevented by proper diet and the use of paraffin oil before meals. Clinically, cancer of the colon is usually not recognized until symptoms of obstruction appear.



The treatment varies with the location and extent of the growth, the condition of the intestines, the patient's vitality, the amount of invasion of adjacent viscera, metastasis, the degree of intra-abdominal tension, the patient's age, and the circumstances under which the operation is performed.

Of great practical interest is the fact that post-operative adhesions are rare in the colon, probably because of hypertrophy of the musculature of the bowel which is then capable of vigorous peristalsis.

Colectomy is the ideal operation for cancer of the colon providing it is possible to secure a sufficient length of pelvic colon into which the end of the ileum can be inserted directly. There are many advantages to colectomy. A perfectly secure junction of the end of the ileum to the pelvic colon can be effected readily; the ileal contents are evacuated at once by means of a large œsophageal tube passed up through the anus for about 6 in. above the junction. This tube is left in for six days. If a large amount of material has collected above the obstruction it is removed in its entirety and the system is freed of its deleterious effects. The abdomen is left flaccid after the operation. There is prompt relief of ileal stasis and its consequences. In cancer in any other situation than about the last kink, resection of the colon removes the risk of a subsequent growth. The operator is enabled to deal effectually with any secondary glandular infection and in a fat patient the risk may be somewhat reduced by dividing the transverse colon to the left of the midline, excising the proximal large bowel, and inserting the end of the ileum directly into the side of the pelvic colon.

In a certain number of cases of acute obstruction, in which the patient's condition does not permit any extensive procedure, a lateral anastomosis between the large bowel proximal to the growth and that distal to it may be effected and colectomy performed later.

When there is a large amount of intra-abdominal tension at the close of the operation it is advisable not to attempt to bring the edges of the muscle wall together, but merely to suture the margin of the skin incision to prevent the escape of intestinal contents.

CLAYTON F. ANDREWS.

**Turner, G. G.: The Surgical Treatment of Cancer of the Rectum: Sacro-Abdominal Excision.**  
*Brit. M. J.*, 1920, ii, 734.

The spread of cancer of the rectum has a direct bearing on its surgical treatment. No matter how extensive an operation is performed it may not bring about cure. Pathologic investigation and clinical experience show that: (1) the local spread of cancer by continuity and contiguity is more important than its dissemination by the lymphatics whether through the lymph stream or by permeation; (2) for a comparatively long period the disease is strictly local; (3) malignancy is activated in the young and vice versa; (4) there are notable varia-

tions in the type of growth, especially with regard to dissemination.

The author outlines the various types of operation which may be performed. The abdominoperineal operation includes the abdominal removal of the entire pelvic colon with its mesocolon, a strip of peritoneum on either side of it at least 1 in. wide, and the lymph nodes situated over the bifurcation of the left common iliac artery. Perineal removal of the whole rectum and its perirectal tissue is also done. Local resection means the cutting away of a part of the circumference of the bowel bearing a growth. Perineal excision is the removal of the whole lower portion of the rectum, including the sphincter, but no part of the coccyx or sacrum is excised. Sacral excision is the extirpation of the whole of the rectum from below after removal of the coccyx and the last one or two portions of the sacrum. The sacro-abdominal excision is a removal which is begun from below by a thorough separation of the rectum as in sacral incision and is completed by opening the abdomen so that the upper limits of a high-lying growth may be removed completely under the guidance of the eye. In abdominal removal the highest part of the rectum is excised entirely from above. In most of the operations described restoration of the continuity of the bowel is impracticable and the combined operations necessitate the formation of a permanent inguinal anus.

K. M. KOONS.

**Miles, W. E.: The Surgical Treatment of Cancer of the Rectum: Operative Methods Compared.**  
*Brit. M. J.*, 1920, ii, 730.

An operation undertaken for the cure of cancer must be based on the pathologic findings and the field of operation must embrace all tissues apt to become invaded. The question of operative treatment, therefore, necessitates a knowledge of the manner in which cancer of the rectum spreads and the paths it takes.

In the early stage an adenocarcinomatous tumor of the rectum is confined to the mucous membrane and submucous tissue. It is sessile and readily movable upon the subjacent muscular coat, gradually increases in size, and spreads in three distinct ways: (1) by direct extension through continuity of tissue, (2) through the venous system, and (3) by means of the lymphatic system.

*Spread of growth by direct extension through continuity of tissue.*—Although the tumor is freely movable at first, it soon becomes adherent. Extension takes place in all directions, but more in the transverse than in the longitudinal axis of the bowel. Adherence begins at the center or the oldest part of the tumor, but surface extension may progress more rapidly in one direction than another, thus fixing the indurated portion nearer one lateral margin than the other.

It is difficult to determine how long a growth has been present. From observations of tumors in the ampulla of the rectum, however, it



may be inferred that by the time three-quarters of the circumference of the bowel is involved the growth is more than one year old.

While the growth is extending around the circumference of the bowel, infiltration of the muscular coat is taking place. This penetration continues until it is arrested for a time by the lymph sinus between the outer surface of the bowel and the surrounding fatty tissue. The growth finally extends across this space and involves the perirectal fatty tissue and the fascia propria of the rectum. Penetrated fixation to the sacrum, prostate, bladder, uterus, or vagina is impossible until the fascia propria has been involved. This would not occur, therefore, until a year after the earliest symptoms indicating the presence of the growth.

Direct extension of carcinoma of the rectum is comparatively slow, and invasion of the surrounding tissues does not take place until the greater part of the circumference of the bowel has become involved.

*Spread of growth by the venous system.*—Microscopic specimens afford evidence of direct invasion of venous radicals. It is therefore easy to understand how even in an early stage cancer cells may be detached and carried to a great distance from the primary growth, especially to the liver. Fortunately, this mode of spread is rare, and definite liver metastases are generally a late manifestation.

*Spread of growth by the lymphatic system.*—The most important route by which cancer cells are disseminated is through the lymphatic channels. In the rectum there are two distinct sets of lymphatic channels by means of which such spread takes place; i. e., the intramural and the extramural lymphatic systems. Dissemination in the intramural system is of very limited extent. The general scheme of the extramural lymphatic channels is represented in Fig. 1. The various tissues traversed by these vessels are vulnerable to metastatic deposits. Corresponding to the three lymphatic areas there are three zones of spread: (1) the zone of downward spread, which includes the peri-anal skin, the ischio-rectal fat, and the external sphincter muscle, (2) the zone of lateral spread, which embraces the levatores ani muscles, the retrorectal lymph glands, the internal iliac glands, the base of the bladder, and the vesiculæ seminales, and, in the female, the posterior wall of the vagina, the cervix uteri, and the base of the broad ligament with Poirier's gland, (3) the zone of upward spread, which includes the pelvic peritoneum, the pelvic mesocolon in its entirety, the paracolic lymph glands, and the group of lymph glands at the bifurcation of the left common iliac artery. The author concludes that early growth in cancer of the rectum may metastasize widely into these zones and cannot be detected by ordinary rectal examination.

The peritoneum, especially that portion which lies on either side of the parietal attachment of the pelvic mesocolon, is very often the seat of growth.



Fig. 1. Schematic representation of the extramural lymphatic system of the rectum and pelvic colon.

Deposits no doubt begin in the subperitoneal lymphatic plexus, and the small intestine, coming into contact with an exposed plaque, may become infected and cause widespread dissemination. The pelvic mesocolon is also very frequently the seat of metastatic deposits even in early cases. Lastly, the paracolic glands may become the seat of metastasis. Cancer cells do not spread according to the anatomical lymphatic distribution but according to laws of their own. Thus metastasis may occur in any or all of these zones irrespective of the position of the primary growth.

Cancer of the rectum, regardless of its position, is apt to spread to the tissues of the three zones described. The most vulnerable of these are the ischio-rectal fat, the levatores ani muscles, the retro-rectal glands, and the pelvic mesocolon. Therefore these tissues must be freely removed in an operation for cancer of the rectum.

Pathology ordains that all tissues involved must be removed. The operations devised to fill these requirements are: (1) perineal excision, (2) perineal resection, (3) vaginal resection, (4) the abdomino-anal operation, and (5) the radical abdomino-perineal operation.

The first four of the operations listed fail because they do not include all points of metastatic involvement. Figs. 2 to 7 illustrate the various operations and the evolution that has taken place.

The radical abdominoperineal operation (Fig. 7) was planned to include the tissues forming the zone of upward as well as of lateral and downward spread. The author performs a preliminary colostomy and later removes the whole of the pelvic colon, except the part utilized for forming the colostomy, together with the whole of the rectum encased in its sheath of fascia propria; the whole of the pelvic mesocolon; the peritoneum lining the floor of the pelvis, together with a strip on either side of the parietal attachment of the pelvic mesocolon; the whole of the levatores ani muscles; the external sphincter muscle; as much as possible of the ischio-rectal fat; and a



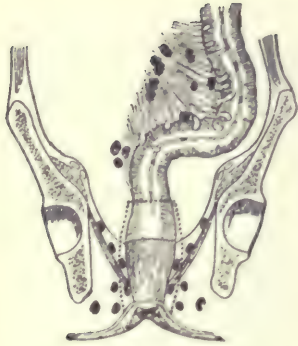


FIG. 2

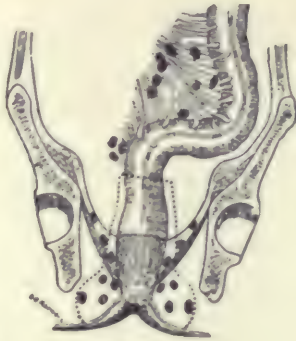


FIG. 3

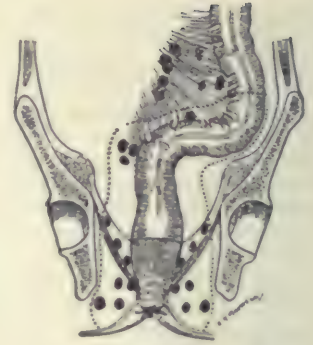


FIG. 4

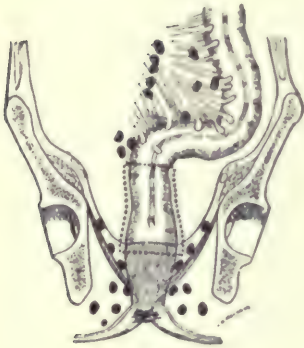


FIG. 5



FIG. 6



FIG. 7

Fig. 2. Diagram showing the restricted nature of Kraske's operation. The rectum is merely dissected out as a tube containing a cancer, and the vulnerable tissues of the upward, lateral, and downward zones of spread are left.

Fig. 3. Diagram showing the first step in the evolution of the radical operation. The peri-anal skin and the ischio-rectal fat were widely removed as these tissues have been found vulnerable to recurrence.

Fig. 4. Diagram showing the extension of the operative field as a further step in the evolution of the radical operation. In addition to the peri-anal skin and the ischio-rectal fat, all of the levatores ani muscles and the lower part of the pelvic mesocolon were included as these tissues were found to be highly vulnerable.

Fig. 5. Diagram showing the limited character of the removal in perineal resection and vaginal resection.

Fig. 6. Diagram showing how much of the vulnerable tissues of the three zones of spread is left behind by the abdomino-anal operation. Even when the proximal end of the colon is brought down to the anus, the vulnerable tissues of the lower zone are left.

Fig. 7. Diagram showing the final stage in the evolution of the radical operation. Whereas the vulnerable tissues in the lateral and downward zones of spread may be removed completely by an operation carried out from the perineum alone, the greater part of these contained in the upper zone remain out of reach. These tissues, which correspond to the axilla in the breast operation, can be removed only by the radical abdominoperineal method.

(*The Surgical Treatment of Cancer of the Rectum—W. E. Miles.*)

wide area of peri-anal skin. The operation should be done on cases of early cancer.

In the author's last series of 11 cases the operative mortality was 18.1 per cent. K. M. KOONS.

**Lockhart-Mummery, J. P.:** Recent Advances in the Surgical Treatment of Cancer of the Rectum. *Brit. M. J.*, 1920, ii, 737.

The most noticeable improvement in operations for cancer of the rectum is the much more extensive resection now performed. Local excision of the growth as done twenty years ago is almost never practiced today.

The author was one of the first surgeons in England to perform the abdominoperineal operation, but soon found it objectionable as a routine procedure, chiefly because of its high mortality. Most of the patients are old and unable to undergo so severe an operation; moreover, it is exceedingly difficult and dangerous in the cases of stout patients. The author still uses it, however, when the growth is situated high or extensive removal is indicated.

Lockhart-Mummery has devised a new technique which permits free removal of the growth and brings the mortality within a reasonable limit. In 1918 he performed the operation twenty-four times with no



mortality. The first stage consists of a preliminary colostomy through the left rectus and abdominal exploration. A week later the second operation is done under spinal anaesthesia. The anus is sealed before the operative field is prepared. The rectum is freed in front and from the perineum upward. The peritoneum is opened from the front and divided close to the rectum. The bowel is divided with the cautery between clamps, and the end is invaginated. The wound is closed without drainage.

In 100 cases the results with regard to recurrences have been quite as good as in those treated by abdominoperineal excision.

K. M. KOONS.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Roberts, D.:** The Roentgenological Diagnosis of Gall-Bladder Lesions. *J. Am. M. Ass.*, 1920, LXXV, 1534.

In view of the advances which have been made in roentgen technique in the last few years, especially in bringing out soft-part detail, the common belief that only from 10 to 15 per cent of gall-stones can be visualized and that the pathologic gall-bladder is rarely demonstrable by roentgen examination is no longer tenable. Few gall-stones are devoid of a lime-containing layer, and even these few may be shown as they are less dense than the surrounding tissues or the fluid in which they lie and hence will cast negative shadows.

While there are at present insuperable obstacles to the visualization of all gall-stones, the roentgen diagnosis will be put on a thoroughly practical and reliable basis with only a negligible proportion of unavoidable errors as the technique is developed and simplified. The enlarged gall-bladder can easily be visualized, but at present it seems that there is a small number of cases of chronic cholecystitis without stones or dilation which cannot be determined by roentgenography. In view of the large percentage of known stones which have been visualized, the importance of negative findings cannot be lightly dismissed. It is impossible properly to estimate the importance of negative findings on the basis of the percentage of failures in a demonstrated series because the failures occur in the cases of heavy subjects. The importance to be attached to negative findings depends on the character of the roentgenograms. In some cases the results do not warrant a negative opinion; in others, they may be fairly satisfactory and make it improbable that stones are present. The perfectly satisfactory series, however, that is, an adequate number of roentgenograms showing a wealth of detail, may warrant a negative diagnosis of stones or enlarged gall-bladder.

The satisfactory roentgenogram for gall-stone diagnosis should show the liver edge clearly, the entire outline of the kidney, and sharp, clear-cut lines of the hepatic flexure. Absolute immobility during the exposure is essential. To this end, the

exposure should not be any longer than is necessary to bring out all possible gradations of density and the penetration of the tube used should be chosen with a similar aim. The use of duplitized films with fast double screens is of great importance in obtaining satisfactory plates. The author's best results were secured with a fine focus gas or hydrogen tube, a plate target distance of from 28 to 30 in., a small diaphragm, and a long cone giving an exposure field of only 5 or 6 in. A parallel spark gap of  $2\frac{1}{2}$  to  $3\frac{1}{2}$  in. was used regularly, and a milliamperage of from 20 to 30 in the tube. Exposures were made with the patient prone on the cassette during forced, sustained expiration. In an effort to bring out detail the film was slightly underexposed and the development pushed short of causing a fog.

With increasing detail the percentage of stones that are definite at a glance is greatly increased, but the majority of diagnoses of stone are reached safely only by prolonged study and a comparison of different exposures. The reducing camera has come into routine use in the study of all doubtful cases as the results it gives in the concentration of images are extremely valuable. Indirect suggestive evidence of a gall-bladder lesion is frequently obtained from a study of the stomach, duodenum, and hepatic flexure of the colon at different intervals after the ingestion of an opaque meal. Antrum and cap distortion not characteristic of ulcer may be extremely suggestive of gall-bladder adhesions, and the constant concavity on the inner side or above the hepatic flexure may serve to locate a dilated gall-bladder which subsequently may be intensively studied. The greatest care is necessary in drawing conclusions from these apparent distortions. On the whole, reliance must be placed chiefly on direct evidence. The recognition of gall-bladder lesions from the roentgen standpoint depends on either the visualization of the gall-bladder or the demonstration of stones, or both.

From clinical and experimental studies of removed gall-bladders and bags containing various solutions and specimens of bile certain conclusions with an important bearing on the interpretation of gall-bladder roentgenograms have been reached:

1. A bag of fluid in the upper abdomen can be visualized more or less distinctly according to its anteroposterior thickness or mass.
2. The density of the image of such a fluid bag varies imperceptibly with the fluid.
3. Pathologic tissue such as a new growth or a thickened gall-bladder wall may be visualized as is the kidney if its mass is sufficiently great, but only in rare cases is the gall-bladder wall sufficiently thickened by inflammation to give rise to a definitely recognizable image.
4. The visualized gall-bladder is a gall-bladder sufficiently dilated and increased above the normal in its mass to give a definite image.
5. In general, fluid is more dense than gall-stones with a low content of lime salts. Experimentally it was found that stones immersed in



fluid and roentgenographed cast a positive or a negative shadow or no shadow at all according to the density of the stones and the thickness of the layer of fluid.

The gall-bladder when visualized is sharp in its outline and suggests a flaccid bag. Its location, shape, and size are variable. Great care is necessary not to mistake for the gall-bladder other suggestive dense shadows which are cast by other viscera, especially the kidney.

As regards gall-stones and their roentgenographic characteristics, the author states that the radial cholesterol stone is less dense than all the surrounding tissue and can be visualized only as a negative shadow, i.e., a round or oval dark spot. The combination stone has a partial or complete layer of limesalt around it. Cholesterol-bilirubin calcium stones do not show as rings or triangles but as solid spots or elongated finger-like dense areas. Common multiple-faceted stones include nearly half of all stones observed. They present an irregular mosaic picture or spotty appearance. In heavy subjects they frequently cannot be visualized and allowance must always be made for this fact in making negative diagnoses. Pure bilirubin-lime stones are usually very small and therefore their recognition is impossible. The calcium bilirubinate stone throws a solid unmistakable shadow.

Of the cases which formed the basis of the conclusions reached, Series 1 included 18 cases which were definitely known to be cases of stone. In all of these the stones were demonstrated by roentgenographic study, although in some instances several attempts were necessary. Series 2 was made up of 70 cases in which stone was suspected. The roentgen findings were positive in 45 and negative in 25 cases. Thirty of the positive and 19 of the negative cases were explored. Three of the positive diagnoses were incorrect, two mistakes being due to the accidental use of the same defective screen in every one of a short series of exposures, and the third being due to a shadow thrown by calcification of undetermined site outside the gall-bladder. No stones were discovered in any of the negative cases, but in 3, chronic catarrhal cholecystitis without dilation was found on removal of the gall-bladder. No stones could be visualized in 3 cases in which operation had not been performed, but in which it seemed probable that stones were present. The third series comprised the cases of young mothers who were referred for a diagnosis of upper abdominal complaints which seemed very definitely to be due to gall-bladder inflammation without stones. In none of these was the gall-bladder visualized, a fact which convinces the author that the catarrhal unobstructed gall-bladder is not demonstrable and that the gall-bladder of normal size can rarely be demonstrated.

The following conclusions are appended:

1. The roentgenological diagnosis of gall-stones and the dilated gall-bladder is possible at the present time, the percentage of failures being small.

2. Negative diagnosis has a value proportionate to the intensity of detail and the sharpness of the image. It has very little value when the subject is so heavy that satisfactory roentgenograms cannot be made. Subjects of slight or medium body thickness can be roentgenographed with an intensity of detail that justifies an experienced interpreter in a negative diagnosis of stones or dilated gall-bladder.

3. The roentgenological diagnosis of gall-stones necessitates such an expenditure of time and money to obtain satisfactory exposures and such extensive experience in the interpretation of intensely detailed roentgenograms that it is not at present a safe and practical method of diagnosis for general adoption. Ten or fifteen per cent of stones can be plainly visualized even by an extremely poor equipment and technique, but under such conditions the importance to be attached to negative findings is negligible.

4. Gall-bladder roentgenograms with satisfactory detail can be made only with direct rays of low penetrating power and duplitized films with fast screens.

5. An insuperable limitation of roentgenological diagnosis of gall-bladder lesions is the apparent impossibility of securing roentgenographic evidence of chronic cholecystitis without dilation or of new growth of the gall-bladder and biliary ducts.

ADOLPH HARTUNG.

McGuire, E. R.: **Two Hundred and Fifty Operations on the Gall-Bladder and Ducts.** *Surg., Gynec. & Obst.*, 1920, XXI, 617.

The author does not believe that a large percentage of the cases of gall-stones are symptomless. In his opinion the "silent common duct" is not silent but merely indistinct.

A carefully taken history is of first importance in the diagnosis. The X-ray is of value chiefly for the negative information it gives. The time is not far off, however, when the X-ray diagnosis will be almost as accurate in cases of gall-stones as it is in cases of renal stones.

The pathology and its bearing on the type of operation chosen is discussed. Cholecystectomy is favored as it gives the highest percentage of cures.

The conclusions drawn are as follows:

1. All gall-stones have their origin in a primary cholecystitis.

2. Typhoid bacilli are present in only from 7 to 10 per cent.

3. The mode of transmission of the primary infection has not been determined positively. It is probable, however, that it is almost always carried by the blood stream, and rarely, if ever, by direct extension. It is doubtless frequently associated with a primary lesion elsewhere in the abdomen.

4. The appendix is very often found to be diseased when stones are discovered in the gall-bladder. Appendix disease is probably the cause of the pri-



mary cholecystitis more frequently than is commonly believed.

5. Gall-stones are rare in young people. Less than 15 per cent of the cases reviewed were those of patients under 30 years of age, while over 60 per cent were those of persons between the ages of 30 and 50 years.

6. Jaundice has received too much emphasis as a diagnostic symptom. Probably when the primary cholecystitis is present, a goodly proportion of the patients have a mild jaundice, but it is slight and usually forgotten. Stones in the gall-bladder or the cystic duct produce jaundice only by exerting pressure on the common duct or by associated cholecystitis.

7. Attacks of pain in the right upper quadrant constitute the most frequent symptom of stones.

8. Cholecystectomy is the operation of choice when there are stones in the gall-bladder or cystic duct. It is probably the operation of choice also when stones are in the common duct, if one is positive all stones have been removed, because stones in the common duct are so often associated with old contracted gall-bladder.

9. The mortality from cholecystectomy is now sufficiently low so that a decision for or against the operation should be based largely on the percentage of ultimate cures.

10. In cancer of the pancreas the mortality is so high that operation is prohibited. If operation is done, an anastomosis between the gall-bladder and stomach is the procedure of choice. K. L. VEHE.

**Lorenz, H.: A Further Contribution to Bile-Tract Surgery; Transduodenal Choledochotomy, the Normal Procedure in Common Duct Stone** (Ein weiterer Beitrag zur Gallenwegchirurgie. Die Choledochotomia transduodenalis—das Normalverfahren bei Choledochusstein). *Med. Klin.*, 1920, xvi, 669.

The transduodenal choledochotomy, which the author recommends for cases of stone in the common duct in preference to supraduodenal opening of the common duct, is performed as follows:

The duodenum in its descending portion is opened across, and through this opening an exploration is made as far as the papilla, the lowest part of the common duct. If a stone is found in the papilla it is removed, the duct being incised as much as necessary. The mucous membrane of the common duct and the duodenum is then quickly sutured with very fine silk.

By this procedure, especially when the bile tract is opened up sufficiently, an examination of the opening of the pancreatic duct is made possible. Healing occurs more quickly than after other methods as often the operative wound may be closed primarily. The differential diagnosis as regards chronic appendicitis and pyloric ulcer the author deems very difficult. In conclusion he urges that operation be performed earlier than is usually the case.

JURAC (Z).

## MISCELLANEOUS

**Ullman, A., and Levy, C. S.: Subphrenic Abscess; Report of a Case with Cure.** *Surg., Gynec. & Obst.*, 1920, xxxi, 594.

Four intraperitoneal and two extraperitoneal spaces are recognized. The subphrenic space is divided into a right and a left part by the falciform ligament. These parts are in turn divided into a larger anterior and a smaller posterior space by the corresponding lateral ligaments. The right extraperitoneal space lies between the layers of the coronary ligament, and the left extraperitoneal space around the upper end of the left kidney in the perinephritic spaces. Pus may collect in any of these spaces and at times may cause symptoms indicating the space involved, as follows:

1. *Right anterior intraperitoneal space.*—The liver becomes adherent to the diaphragm in front, pus is localized at the upper and posterior parts of the process, and the diaphragm is pushed up, giving signs of right lung compression. This type usually follows appendicitis. Because of adhesions, the liver does not descend; therefore the right hypochondrium and epigastric regions are not tender.

2. *Right posterior intraperitoneal space.*—Swelling is noted in the right hypochondrium, and occasionally also in the right lumbar region. This type is most often associated with other varieties of subphrenic abscess.

3. *Left anterior intraperitoneal space.*—The abscess is usually due to a perforated gastric ulcer. There is swelling in the epigastrium and left hypochondrium with signs of compression of the left lung. This type of abscess contains gas.

4. *Left posterior intraperitoneal space.*—The signs are suggestive of pancreatic cyst. Abscess is rare.

5. *Right extraperitoneal space.*—Infections from the right kidney, the posterior surface of the duodenum, and a retrocaecal appendix may burrow along the space, pushing the peritoneal reflection of the liver further back and the liver lower into the abdomen. The abscess may extend between the layers of the falciform ligament and point in the midline of the epigastrium. This type of abscess may be incised without opening the peritoneal cavity. It must be differentiated from the right anterior intraperitoneal abscess where the liver cannot be pushed down because of adhesions.

6. *Left extraperitoneal space.*—This space is situated in the retrocellular tissues of the left loin. Infection arises from the left kidney, the pancreas, the ascending colon, and the lumbar glands. Abscesses in this space are rare.

As a clinical basis Piquand's classification is satisfactory: (1) anterior inferior abscesses mainly with abdominal signs; (2) superior subphrenic abscesses with thoracic symptoms; and (3) retroperitoneal abscesses with signs of lumbar swelling. Abscesses are more common on the right side than on the left side and the intraperitoneal type is more common than the extraperitoneal type. Bilateral abscesses



are infrequent. After appendicitis the intra-peritoneal variety is the more common.

The collection of pus below the diaphragm has been attributed to: (1) the suction action of the thorax during respiration; (2) the lymph circulation from the peritoneal to the pleural cavities through the stomata of the diaphragm; and (3) gravitation. The view most generally accepted today is that the force of gravity is responsible. When the patient lies on his back the kidney and the thick lumbar muscles form a mound between the subphrenic space and Douglas' pouch in the female and the retrovesical space in the male. Pus gravitates into the two depressions so produced.

In appendicitis the subphrenic space may be infected in the following ways: (1) as part of a general peritonitis; (2) by slow extension from the pelvis up the lumbar peritoneal fossæ; (3) through the portal vein as a pyelophlebitis; (4) by lymphatic extension up the retroperitoneal cellular tissue or up the lymphatics, around the deep epigastric artery, to the falciform ligament.

Infection by the peritoneal route produces intra-peritoneal abscesses; by the cellular tissues, extra-peritoneal abscesses; and by the lymphatic route, both types. Abscesses may contain pus or pus and gas. In unusual cases bile, faecal and alimentary substances, pancreatic juice, and echinococcus hooklets have been found. The bacterium discovered most frequently is the bacillus coli. Streptococci, pneumococci, and staphylococci are less common and anaerobes are rarely present. Pus and gas are formed in about 25 per cent of the cases. Gas may have its origin in the intestine, stomach, or lungs or may be formed spontaneously. When it is of intestinal or gastric origin its presence in a subdiaphragmatic abscess is due to the perforation of a hollow viscus of the gastro-intestinal tract. When it is of pulmonary origin the abscess has ruptured a bronchus. When it is formed spontaneously it is usually due to fermentation.

The symptoms of subdiaphragmatic abscess may be acute or insidious. The general signs and symptoms include pyrexia, tachycardia, anæmia, emaciation, chills, and polymorphonuclear leucocytosis. In many cases a tumor is found in the hypochondrium or epigastrium and in some instances may be discovered in the lumbar regions. Because of adhesions, such a mass may be immovable. When gas is present liver dullness may be obliterated and replaced by tympany. In many cases it may be difficult to differentiate subphrenic abscess from general peritonitis, especially when pain, vomiting, and meteorism are prominent symptoms.

The thoracic signs are usually those of pulmonary compression. Consolidation of the lung tissue or empyema may be present and the heart may be displaced and even rotated. In the presence of gas, areas of tympany shifting with position may be made out. Dyspnoea, cough, and the expectoration of foetid sputum may occur when the abscess ruptures into a large bronchus.

The complications may be classified as thoracic and abdominal. Thoracic complications include pleurisy, perforation of the diaphragm, rupture into the pleural cavity, rupture into the lung, and pericardial complications.

Pleurisy without perforation of the diaphragm may be fibrinous, serofibrinous, or purulent and may occur through the lymphatic anastomosis of the peritoneal and pleural cavities. Pneumonic patches lie adjacent to the subphrenic abscess. Perforation of the diaphragm occurs at the juncture of the costal and lumbar fibers in retroperitoneal abscess, while in cases of the intraperitoneal variety of abscess its site is usually the center of the diaphragm. The perforation may vary in size from that of a pinhead to that of a half dollar. The signs of rupture into the pleural cavity vary according to whether the pus is free or localized and whether gas is present or not. When the abscess ruptures near the center of the diaphragm the infection is usually walled off, but when it ruptures in the costophrenic space, adhesions are not common and empyema occurs. In the presence of gas the following zones are made out from above downward, with the patient in the sitting posture: (1) lung resonance, (2) dullness corresponding to the pleurisy, (3) tympany due to the gas of the abscess, and (4) flatness due to pus. Rupture into the lung may result in the formation of pneumonic patches, gangrene, or rupture into a bronchus. If there are adhesions between the diaphragm and the lung pus may escape directly into the lung without entering the pleural cavity. Pericardial complications can be demonstrated only by autopsy.

The abdominal complications of subphrenic abscess consist of: (1) peritonitis, which is rare; (2) rupture into the alimentary tract, which is fatal and associated with the vomiting of pus; (3) rupture into the bladder or a ureter, a rare complication; (4) an opening through the skin, usually in the right hypochondrium.

For the detection of pus below the diaphragm aspiration with a needle and syringe is indicated. The needle should be introduced at least 3 in., beginning in the tenth interspace in the scapular line. If pus is not found, other trials should be made consecutively in the ninth, eighth, seventh, and sixth interspaces from below up. If these also are negative, the needle should be introduced in the axillary line from below up. The roentgenogram is an invaluable aid in the diagnosis.

The prognosis depends upon whether the treatment is operative or expectant. In the author's opinion the treatment is entirely surgical. The posterior routes of approach are better than the anterior. The method of choice is the posterior transpleural method with resection of the rib. The diaphragm is fixed to the intercostal muscles with sutures and the abscess then drained. When the abscess points to the abdomen it may be opened in the midline or parallel to the ribs without entering the peritoneal cavity. In cases of retroperitoneal abscess the lumbar route is employed.

I. W. BACH.



**Connell, F. G.: Abdominal Symptoms in Pneumonia.** *Wisconsin M. J.*, 1920, xix, 279.

The diagnosis of pneumonia as appendicitis is probably much more frequent than the reported cases indicate. This mistake is due to the fact that in early pneumonia there may be abdominal symptoms in the form of sudden pain and tenderness while frequently during the first twenty-four hours the pulmonary symptoms and physical signs are absent. The abdominal symptoms are due to referred nerve impulses. The author discusses their mechanism.

In the diagnosis of abdominal symptoms, therefore, it is important to bear the possibility of pneumonia in mind, especially when the patient is a child. The X-ray will be found of great value as a diagnostic aid.

K. L. VEHE.

**Faschingbauer, H., and Eisler, F.: Diagnostic Experiences with Artificial Pneumoperitoneum** (Diagnostische Erfahrungen mit dem artifiziiellen Pneumoperitoneum). *Wien. klin. Wchnschr.*, 1920, xxxiii, 853.

Gas inflation of the abdomen as a diagnostic aid was first carried out by Weber, Lorey, Meyer-Betz, and Rautenberg. Rautenberg's work was confined to cases of ascites in which he supplanted the extracted fluid with oxygen. Goetze, who has done much to perfect the technique of the method, was the first to subject his technique to surgical tests.

Although the Viennese hospitals were rather conservative in taking up gas inflation, they now, as the result of considerable experience, have adopted a definite technique.

For several days prior to the examination the intestines are kept well evacuated; no food is given on the day of the examination and immediately before it the patient is directed to empty his bladder. A subcutaneous injection of morphine is given and the patient placed on an X-ray table which can be tipped to any angle. He is then screened in the dorsal position to ascertain the amount of gas in the gastro-intestinal tract. Unless contra-indicated by adhesions, the site of election for the inflation is about 3 cm. below the navel and through the center of the right or left rectus muscle. The solidity of the muscle at this site insures a good closure after the withdrawal of the needle. Under local anæsthesia a fine, sharp-pointed injection needle, 8 cm. long, is passed through the muscle. When it reaches the posterior sheath, which is determined by the increased resistance, the needle is connected with a Franck pneumothorax apparatus which injects the gas under a pressure of 300 mm. of water. The rectus sheath and peritoneum are pierced and the gas allowed to enter the peritoneal cavity under observation with the fluoroscope.

From 1.5 to 3.1 liters are insufflated according to the size of the cavity, the tenseness of the abdominal walls, and the patient's sensitiveness. The needle is then removed. After the screen examination a slightly larger needle is introduced under screen

control and the greater part of the oxygen is allowed to escape. Leaving the gas in the cavity causes considerable discomfort. Spontaneous resorption does not take place under from four to six days and in some cases not before several weeks.

Occasionally a slight increase in temperature was noted and in two cases a cutaneous emphysema resulted from the puncture. There is practically no danger of gas embolism or infection if the authors' technique is followed. Injury to the intestines at the site of adhesions is hardly possible if the insertion is made under screen control.

Insufflation is contra-indicated in the cases of patients with acute inflammatory conditions of the peritoneum and diseases in which an increase in the intra-abdominal pressure is undesirable.

The patient should be screened in various positions. First, with the head high and then low; second and third, in the left and right lateral positions with the same variations. The transition from one position to the other must be made slowly under continuous roentgenoscopy. Special attention should be paid to the various changes in form and position of the organs. The patient should next be rayed in the knee-chest position, right-left and left-right, and finally in the standing position.

For contrast the stomach is often distended with effervescent powder and the colon by insufflation. Various difficulties arise in the interpretation of the X-ray picture. Following the law of gravity and because of their own elasticity the organs often manifest changes in shape and position which make it difficult to distinguish between the normal and the pathologic.

Gas dilatation of the stomach and colon gives an unusual view of the liver, especially of the diaphragmatic surface. Its size and form are best judged with the patient upright. The right lobe is made out most clearly in the dorsal, left diagonal, or lateral positions. The left lobe is generally seen in the right diagonal upright position. If there are no adhesions, the organ is separated from the abdominal wall and diaphragm. The smooth surface of the normal liver is shown by very distinct shadow boundaries. The liver is very pliable and often, because of increased intra-abdominal pressure, may have an appearance suggesting a pathologic condition. An increase in size is readily made out. An increase in the consistency of the organ is expressed by a loss of the normal changes in shape; the upper surfaces retain their convexity.

Insufflation is of advantage from the diagnostic point of view chiefly in conditions difficult to recognize clinically, such as atrophic diseases of the liver. In atrophic cirrhosis the finely uneven surface of the liver causes the normally distinct margin of the liver shadow to become blurred. If a disease focus is situated near the surface of the liver, the procedure is a definite aid to diagnosis. It is of great value also in the search for metastatic growths but offers no special advantage in the diagnosis of diseases of the gall-bladder.



The spleen can be readily made out; the notch, the smooth posterior margin, and the hilus are not infrequently seen very clearly. This organ has not the pliability of the liver, and changes in size are readily discernible.

No distinct advantage has been gained from insufflation in the diagnosis of pathologic conditions of the gastro-intestinal tract. At times the lower portion of the stomach may be clear, but the fundus and cardia are generally not visible. If the stomach is dilated, its posterior wall may be seen above the liver shadow and peristaltic movements may be easily followed. Peristalsis at the antrum may be recognized by a gradually decreasing wave running toward the pylorus and disappearing at that point. If the pylorus is open it also appears in the form of a small ring. The combined method of gas distention and insufflation often gives valuable data in the diagnosis of gastrectasis and gastropnoia. The small intestines are generally forced into the lower abdomen by the gas and are not easily distinguished. The first part of the colon may be readily made out in the left lateral position, especially after contrast insufflation. The transverse colon is seen in the right lateral position. The descending colon is difficult to make out, as is also the sigmoid which in all positions is covered by the bony pelvis.

In the knee-chest position the mesentery of the small intestine spreads out like a fan. Normally it shows several strand-like thickenings. Shrinkage of the mesentery due to disease produces an irregularity in its outline; a loop of intestine may be drawn up and sharply kinked.

The pelvic organs may be demonstrated with the patient in the lateral position. The full bladder or enlarged uterus is easily recognized as are also the adnexa and tumors of the rectum.

Adhesions are very easily seen, especially if they connect the abdominal wall and one of the intraperitoneal organs. Adhesive perihepatitis and perisplenitis are usually diagnosed readily, but perigastritis and perisigmoiditis are made out with certainty only when there are adhesions to the anterior abdominal wall. In carcinomatosis of the peritoneum the areas of malignancy are often indicated by small dull spots.

Fluid in the abdominal cavity may be recognized when present in quantities not demonstrable by physical examination.

The kidneys may be distinguished at times by appropriate lateral raying. Anomalies in position and diffuse or focal enlargements were noted in a number of cases. Valuable information may be obtained with regard to diseases of the abdominal wall or diaphragm and various types of hernia.

In the dorsal, lateral, or upright position the diaphragm usually appears as a single line, or double lines several centimeters apart. At times it is seen in the form of many intersecting curves which probably signify a certain independence in the contraction of the various diaphragmatic parts.

Small pleural effusions are easily recognized in the phrenocostal angle. Pleural adhesions as well as the contour and action of the heart are also demonstrable.

The method is easily carried out, and if care is used in the selection of cases it is not a dangerous procedure. The inconvenience to the patient is slight. Valuable diagnostic data are often obtained which at times are of such a nature as to obviate the necessity for an abdominal exploration. If properly indicated, the method should be employed as a diagnostic aid.

A. J. SCHOLL, JR.

Jordan, A. C.: *An Address on Stasis and the Prevention of Cancer. Brit. M. J.*, 1920, ii, 959.

In connection with the theory that long-continued irritation is a cause of cancer the author brings forward the idea that the toxæmia of chronic intestinal stasis renders every body cell less resistant to cancerous change. The so-called "cancer diathesis" may be merely constipation, the true pathologic condition being torsion of the ileum, a kink, or a mobile cæcum. The tendency toward stasis may be overcome by medical, hygienic, or surgical means.

The beginning of stasis can be traced to an early period in life, often to infancy. Toxins produced in the lower ileum and cæcum enter the blood and may reach every cell in the organism. Bands form in the large intestine as the result of stasis and kinking from these may result in local trauma. Chronic catarrh constricts the lumen and may cause colitis. The latter and diverticulitis often precede cancer. Frequently the splenic flexure is kinked and at times a strong hepatocolic band distorts the transverse colon. It is noted that in feeble organisms the propulsive effort is slight and as the trauma is therefore less severe, cancer is less apt to develop than in more robust persons.

Kinks in the small intestine, however, seldom cause permanent obstruction but may produce ileal or duodenal stasis. In ileal stasis organisms from the lower ileum may enter the duodenum and cause ulcer. Duodenal ulcer occurs only when the duodenum is distended by a duodenojejunal kink. Pyloric spasm is induced by a distended duodenum. The onslaught of strong muscular waves at the spastic pyloric ring gives rise to congestion, and infection by organisms from the duodenum may thus result in gastric ulcer.

The formation of a gastric cancer is due to congestion of the lesser curvature by tension from a dropping, dilated stomach. The pyloric spasm and preceding duodenal distension are again the primary factors.

Esophageal cancer may be produced also by congestion at the cardia due to the tension of a dropped stomach. The impact of food boluses at the tracheal bifurcation may cause esophageal cancer at this upper site. The accessory glands, liver, and pancreas may become the seat of cancer as a result of congestion of their duct orifices and parenchyma by



duodenal distension. The liver receives the circulating toxins direct.

Congestion due to intestinal stasis and adherent bands plays an important rôle in cancer of the uterus and ovaries.

The author advocates the education of the public with regard to the evils of intestinal stasis and emphasizes the importance of surgical intervention when indicated to correct the condition.

J. W. Ross.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**De Gaetano, L., and Scigliano, S.: Pyogenic Osteomyelitis Chronic for Forty-Three Years** (Osteomielite piogena cronica 43 anni fin dall' inizio). *Riforma med.*, 1920, xxxvi, 757.

The patient was a man 60 years of age. At 11 years of age he suffered a traumatism between the middle and lower thirds of the left thigh. The limb was much swollen and painful but recovered under massage, etc. The patient's present condition he referred back to his sixteenth year when the injured region increased in size and became flexed. At this time, however, there was no fever or general disturbance. The swelling finally opened, giving issue later on to pus and blood. The condition became cured but recurred intermittently after periods of years during which the patient was able to attend to his work.

Examination and the Wassermann test showed that the patient had never suffered from syphilis. The cutaneous von Pirquet reaction was also negative and it was impossible to isolate the Koch bacillus. The limb was atrophied. The skin at the union of the lower and middle thirds of the thigh was discolored and on the internal surface gave issue to a yellowish discharge. Examination of the bone in this area showed an apparently limited partial necrosis and marked deformity of the lower third of the femur with considerable loss of substance. Macroscopically the fluid collected from the region appeared to be sterile pus. On culture the staphylococcus pyogenes aureus was obtained abundantly. A diagnosis of suppurative osteomyelitis due to the staphylococcus and chronic from its beginning was made.

A trephination of the lower extremity of the left femur was done and numerous sequestra were eradicated. Bacteriological examination of this material showed the presence of staphylococcus pyogenes aureus. W. A. BRENNAN.

**Goedel, W.: The Causation and Treatment of Epicondylitis** (Beitrag zum Wesen und der Behandlung der Epicondylitis). *Muenchen. med. Wchnschr.*, 1920, lxvii, 1147.

This article is a report on 22 cases of epicondylitis observed for a long period of time. The responsible factor was direct trauma in 6 cases and indirect trauma in 3 cases. In 10 cases no history of trauma was obtained. Five of the patients were men and 17 women.

Epicondylitis occurs not only in the external epicondyle of the humerus but also in other bony projections. In the cases reported the external epicondyle of the humerus was affected in 8, the styloid process of the radius in 9, the head of the fibula in 1, the median epicondyle of the femur in 3, and a metacarpal head in 1. In all these cases the three cardinal symptoms were elicited: (1) localized pain on pressure, (2) fatigue and weakness of the affected part of the extremity, and (3) functional disturbance. Inconstant symptoms were swelling, redness, and sensory disturbances. The X-ray picture showed no constant or characteristic findings.

In 2 cases the removed epicondyles were examined histologically; one consisted of lamellated bone and firm connective tissue with metaplastic bone formation, and the other of partially calcified cartilage and periosteal new bone formation of non-specific character. Apparently a calcification or ossification of cartilage tissue takes place in this condition. Epicondylitis at the styloid process of the radius may be confused with tendon-sheath inflammation or tendovaginitis stenosans (styloiditis), while in the upper arm it may be mistaken for neuromyositis.

Epicondylitis is a disease not easily influenced by treatment. Massage aggravates it. In cases in which the ordinary treatment—painting with iodine and the application of hot air—had no effect Goedel obtained the best results with three or four injections of 70 per cent alcohol, these being supplemented with rest of the extremity and hydrotherapy during the night. If such measures fail, the author recommends the removal of the affected part under local anaesthesia. A pedunculated fat flap should then be sutured to the raw cartilaginous and bony surface so that the skin does not adhere to the bone. The traumatic form of epicondylitis heals much more quickly than the idiopathic form. REINHARDT (Z).

**Collins, C. U.: Volkmann's Contracture of the Forearm.** *Illinois M. J.*, 1920, xxxviii, 497.

A boy, 7 years of age, fractured both bones of the forearm and was treated with anterior, posterior, and interosseous splints. Three weeks later when the splints were removed, the result was apparently good. The thumb and fingers, however, began gradually to contract. Three months later a typical Volkmann's contracture developed with ulnar anaesthesia.

Because of the bony deformity of the ulna, the callus was sawed and the ends freshened and wired. At that time a small hæmatoma was found in the muscle and the muscle was transfixed in the callus.



Massage and manipulation given for two months resulted in improvement but extension was still impossible. All of the flexor tendons were then lengthened and this operation was followed by massage.

Sixteen years later the case was still under observation. There was complete restoration of function with no deformity. The patient was accepted into the army without question.

In the author's opinion there must be other causes for this condition besides tight bandaging. In the case reported it is probable that the hæmatoma and the transfixation of the muscles were important factors in the impairment of the circulation.

Collins compares the operation of lengthening tendons with the operation of shortening the bones. He considers the former much less formidable and the end-results more desirable. R. V. FUNSTEN.

### FRACTURES AND DISLOCATIONS

**Blake, J. A., and Worcester, J. N.:** *The Application of War Methods of Treating Fractures to Those Occurring in Industrial Occupations.* *Minnesota Med.*, 1920, iii, 565.

The treatment by suspension with traction finds its greatest value in fractures of the long bones, particularly the femur and humerus. It is of great aid also in cases of fracture of the leg and certain compound fractures of the forearm but there are many fractures, such as the Colles' and Potts', which are more readily treated by other methods.

One of the greatest advantages of suspension for fractures of the femur and humerus is the fact that it gives better fixation of the fragments. To understand this principle thoroughly it is necessary to study closely the forces which tend to produce or restrain motion between the fragments. These forces may be intrinsic or extrinsic. The intrinsic, such as the force exerted by the muscles, tendons, etc., cause overlapping of the fragments, while the extrinsic, such as the force of gravity, cause angulation and improper fixation of the proximal fragment when the body is moved laterally.

When the proximal fragment is short in fractures of the long bones its position in relation to the body is determined by the contractions of the muscles inserted on it and is not influenced by extrinsic factors. The restraining action of the muscles which bridge the fragments is almost negligible and can be said to be exerted only when traction is made in the direction which the short proximal fragment occupies by reason of the intrinsic forces acting upon it.

Hence, as it is impossible to control the position of the proximal fragment in high fracture except to a slight degree, it is necessary to make the distal fragment conform to it. On account of the position of extreme abduction and rotation sometimes occupied by the proximal fragment, it is practically impossible in some cases to maintain the distal fragment in proper position by means of splints alone. By suspension, however, the limb may be placed in any

position desired and traction may be applied in that position. When traction is applied to the distal fragment in a direction corresponding to the direction of the proximal fragment there is very little motion between them.

By the method described the greatest possible amount of motion is obtained in the joints both proximal and distal to the fracture. Counterpoised suspension allows the limb to swing freely except insofar as it is limited by the traction and at the same time permits the application of traction to the distal fragment itself. The fractured bone may move freely but the fragments retain their relative position.

The advantages gained by free movement of the joints of the injured limb are: (1) early active and passive motion; (2) improved circulation; (3) no stasis; (4) rapid disappearance of swelling; (5) shortening of the period of consolidation 25 per cent; and (6) shortening of the period of convalescence from 50 to 100 per cent.

Errors in the treatment are: (1) the use of incomplete apparatus; (2) improper traction in the wrong direction and in insufficient amount; (3) insufficient use of skeletal traction (tongs); (4) improper fitting of Thomas splints and non-employment of Pearson's leg piece; (5) failure to keep the supporting bands taut and pulleys running easily, and improper distribution of the weight.

In 30 cases of fractures, including 20 fractures of the femur and 10 fractures of the humerus, an excellent result was obtained in 27.

P. H. KREUSCHER.

**Tzaico, A.:** *Temporary Osteosynthesis Effected with a Removable Internal Prosthesis* (L'ostéosynthèse temporaire par prothèses internes amovibles). *Presse méd.*, Par., 1920, xxviii, 776.

An osteosynthetic method should give perfect immobilization of the bone extremities so that indirect retention by external apparatus will be unnecessary. The osteosynthetic apparatus should be simple and easy to apply and remove.

The author describes a method by which osteosynthesis may be effected with internal metallic plates. The essential parts of the apparatus described are: (1) a bayonet-shaped splint; (2) temporary screws; and (3) Juvara's automatic ligator. The bayonet splint is formed by a rectangular strip of nicked steel 20 cm. long, 17 mm. wide, and 1 mm. thick. It is bent twice to the shape of a bayonet. The first portion is applied along the bone at the site of fracture. The second, which is bent at an obtuse angle to the first portion, passes through the soft parts. The third part forms the sleeve of the splint by which it is extracted when consolidation of the fracture has been obtained. The splint proper is curved according to the shape of the bone surface and is perforated with four holes, two for wire ligatures and two for the passage of fixing screws of nicked steel varying in length according to the thickness of the tissues covering the bone. Juvara's



automatic ligator effects a perfect ligation with metallic wire encircling both the bone and the splint. After consolidation of the fracture it allows the extraction of the wire without operation. The bone extremities and the splint are so tightly held that they are completely immobilized.

After reduction of a fracture the coapted bone extremities are kept in position by an assistant with a Faraboeuf separator, the large blade of which is passed around the fracture. The first part of the metallic splint is then fitted over the site of the fracture and fixed along the bone by means of the screws. The wire ligatures are then applied. The screws are placed in the normal bone as far as possible from the site of fracture. Indirect contention of the fracture by plastic apparatus when the operation is completed is absolutely unnecessary. The wound is sutured, openings being left only for the screws, the ligatures, and the sleeve of the splint, and is covered with a sterile compress. When consolidation is effected, the screws, ligatures, and metallic splint can be removed easily without causing pain.

The author states that the results obtained by his method are the best that can be obtained by osteosynthesis. Coaptation and immobilization are perfect; consolidation is effected with the least delay and without the least shortening. As plaster appliances are unnecessary, the joints are free and there is no stiffness or ankylosis. The splint issuing through the tissues acts as a drain and prevents sepsis.

An illustration shows schematically the application of the bayonet splint in the case of a transverse fracture of the femur.

W. A. BRENNAN.

**Henderson, M. S.: Old Fractures.** *J.-Lancet*, 1920, n.s. xl, 687.

Old fractures may be defined as those which are troublesome beyond the time ordinarily allotted for the return of function. The reason may be malunion, delayed union, non-union, limitation of joint motion, ischæmic paralysis, a local manifestation of a general condition, such as carcinomatosis, tabes dorsalis, the various forms of osteomalacia, or a complication of a local bone condition such as sarcoma or fibrocystic disease.

Anatomical malunion does not necessarily impair function. The loss of proper alignment in the lower extremities is apt to cause more disability than malunion in the upper extremities. The shortening and static arthritis due to faulty weight-bearing may cause much disability, especially in the femur.

The disability following a Pott's fracture is usually due to valgus position of the foot and can be corrected only by osteotomy of the fibula and the internal malleolus and replacement of the astragalus near its normal position. Posterior displacement of the astragalus due to crushing of the astragalus or the posterior articulating surface of the tibia is best treated by astragalectomy or arthrodesis.

In the treatment of malunion the question is not one of obtaining union, but of correcting deformity. The normal line of weight-bearing should be restored and the fragments held in position. Foreign materials for internal fixation should be used only when absolutely necessary, the absorbable materials being much preferable. Should non-absorbable material be necessary, the patient should be informed that in all probability such material should be removed as soon as it has served its purpose and union is firm. Beef-bone plates and screws are of value as they are readily absorbed (Figs. 1 and 2).

Cases in which a fracture shows continued evidence of callus formation without actually becoming solid after the normal time for union has passed are classed as cases of delayed union. The false motion may be so slight that only the patient himself can detect it. Although as a rule union can be secured in these cases by conservative measures, it can be hastened by operation. Perhaps the most frequent causes of non-union are the interposition of muscle or fascia, insufficient fixation, and repeated and too frequent examinations. The author does not believe that syphilis or X-ray exposure plays as large a part in the etiology of delayed or non-union as is generally supposed.

Cases of true non-union may be of ten to fifteen years' duration and show no callus formation; operation offers the only chance of restoring function. The humerus is most often involved in non-union; delayed union occurs most frequently in the tibia. Non-union occurs frequently also in fracture of the neck of the femur because of the difficulty of maintaining apposition. The methods of treating cases of non-union and delayed union are similar, but it should be remembered that it is much more difficult to secure union in the non-union group of cases. In both instances the use of the inlay or massive graft is the method of choice. Osteoporosis is a serious obstacle and should be overcome before operation by stimulating the production of bone salts by use of the extremity. A side-to-side approximation or a mortice may be sufficient in cases of delayed union, but in true non-union it is safer to

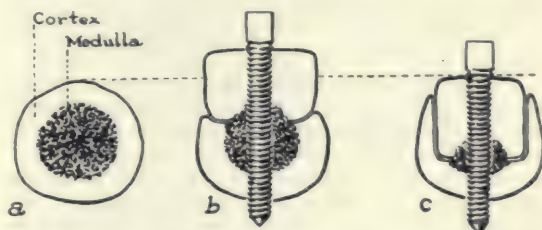


Fig. 1. *a*, Transverse section of bone. *b*, Large bone graft shown in apposition to fragment from which part of the cortex has been lifted to permit broad contact of the graft with the fragment; held in place by beef-bone screw through opposite cortex. *c*, Inlay method; beef-bone screw placed through the graft and opposite cortex.



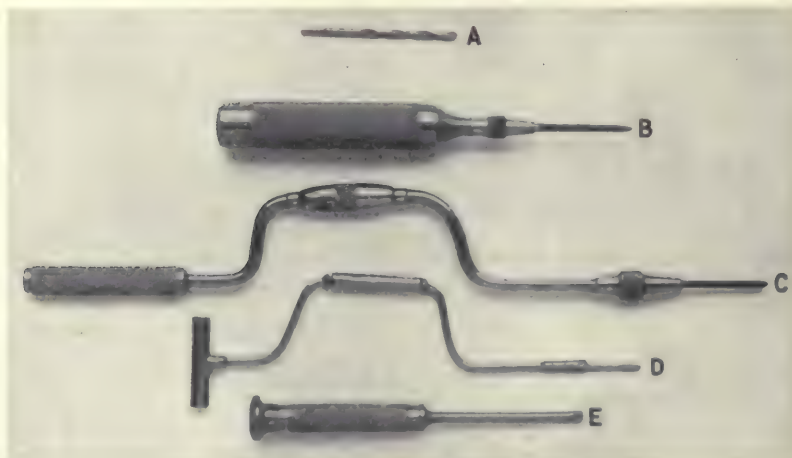


Fig. 2. Instruments necessary for the placing of beef-bone screws: A, No. 17 twist drill; B, straight handled 10x24 tap; C, offset handle 10x24 tap; D, offset handle wrench with hexagonal headed beef-bone screw in socket; E, straight handle wrench.

(Old Fractures — M. S. Henderson)

use a large bone graft which will insure mechanical fixation until new bone is formed.

Limitation of joint motion due to loss of elasticity of muscles will yield to activity. When due to degeneration of the muscle fibers the stiffness is apt to be permanent. Baking and massage are valuable, and the tendons may be lengthened. When the condition is due to exuberance of callus, the removal of the obstruction is indicated.

Ischæmic paralysis is to be avoided by care in the application of casts and splints and in rare cases by relieving the pressure from hæmorrhage within the extremity itself by multiple small punctures.

Pathologic fractures occurring in cases of carcinoma, sarcoma, and tabes dorsalis are treated first with regard to the general condition. Fibrocystic disease rarely causes non-union.

J. I. MITCHELL.

**Rotter, H.: Fractures of the Lower End of the Radius** (Ueber Frakturen des Radius am unteren Ende). *Deutsche Ztschr. f. Chir.*, 1920, clvi, 235.

Fracture of the radius is the most common fracture of the arm and of all fractures. From a review of the literature the author finds that the mechanism of fracture has been variously interpreted. At first the theory of coup and contrecoup was prevalent. Later this was displaced by the "tearing-off" theory. Subsequently a combination of the two theories was accepted. Some authors attribute fracture of the radius to the force exerted by the carpus.

Rotter regards the radius as a more or less elastic rod upon which the fracturing force is exerted by the extended hand under the weight of the body. A

fall upon the hand tends to bend the forearm. In an oblique fall epiphyseal separation may occur.

From the mechanism of fracture conclusions may be drawn regarding the therapy. The fractured ends must be placed in the best possible coaptation in such a position that redislocation will be impossible and the neighboring joints are in median position. In the past the last requirement has not been adequately met. Coaptation of the fractured ends the author obtains by placing the forearm upon the edge of a table and producing dorsiflexion of the hand (short, sharp movements) followed by traction on the hand and pressure upon the ulna. He then makes continuous traction and rotation toward pronation. Ethyl-chloride anæsthesia is used. The arm is then placed in pronation upon a Cramer splint with slight dorsiflexion of the hand. Early movement is possible and the splint is removed in three weeks. The various stages of reposition may be varied according to the mechanism of the fracture.

E. GLASS (Z).

**Mueller, H.: The Forms of Fractures in the Lower Third of the Forearm** (Ueber die Formen der Vorderarmbrueche im unteren Drittel). *Deutsche Ztschr. f. Chir.*, 1920, clv, 267.

Mueller reports 134 fractures in the lower third of the forearm. Seventy-six were in the right arm and 58 in the left. Fracture of the radius alone was more common in the male than in the female (93:41). Thirty-nine per cent of the fractures occurred during the first and second decades of life. By means of the X-ray it was shown that 108 fractures of the radius alone occurred near the lower epiphyseal line and 26 above it. Of 108 fractures of the radius alone 83 were located at the typical site. A very



frequent complication, fracture of the styloid process of the ulna, was present in 63 cases (47 per cent). Among 89 transverse or oblique fractures of the radius it was present in 42 (47 per cent). Epiphyseal separation occurred in 19 cases.

In conclusion the author states that the typical fractures of the radius, supracondylar fractures, and epiphyseal separations may be included in one large group on the basis of their traumatic etiology. The styloid process of the ulna was fractured in about one-half of the cases (47 per cent). The fracture occurs at the base of the styloid process. In adults the fracture at the epiphyseal region is typical but in children supracondylar fracture and epiphyseal separation occur most frequently.

KOLB (Z).

**Zuccari, F.: The Mechanism and Evolution of Fracture of the Carpal Scaphoid** (La frattura dello scafoide del carpo; suo meccanismo ed evoluzione). *Clin. chir.*, 1920, n.s. ii, 686.

Isolated fractures of the carpal bones are extremely rare. Isolated fracture of the scaphoid Bardenheuer and others believe is due to direct action. Bouchet and Zuccari have caused it experimentally. Such a fracture may be produced by a violent blow on the thenar eminence of the hand when it is in dorsiflexion and by a fall on the palm or on the back of the hand when it is in exaggerated extension or flexion. In a study of these two movements and the action of the ligaments the author found that the theory attributing the fracture to crushing is more probable than the theory ascribing it to drawing up of the ligaments.

Apart from its relation to the neighboring bones, the form and structure of the scaphoid increase its liability to fracture. In exaggerated extension of the hand the scaphoid is acted on by two opposing forces, one proceeding from the trapezium and trapezoid, which acts dorsally, and the other being palmar. Fracture is favored also by the change in the position of the scaphoid in exaggerated extension of the hand. In exaggerated palmar flexion the carpal extremity of the scaphoid, drawn by the second row of the carpals, tends to become displaced forward and to emerge from the glenoid cavity where it is held by its connections to the other bones of the first row of carpals and especially by the tendon of the long extensor of the radius. Under such circumstances fracture may be due to crushing or flexion of the bone on its concave side.

The author studied also the behavior of the fragments and the mechanism of displacement. He explains 3 cases which he observed. In 1 of these the fracture was strictly transverse, the fragments remaining almost in contact and suggesting physiological division of the bone.

In the evolution of the fracture the production of callus is always slight, being hardly sufficient to close the cavity in the spongy portion of the bone. Because of this fact and trophic alterations, rigidity of the hand results.

W. A. BRENNAN.

**Speed, K.: Tendon Transplantation for Wrist-Drop.** *Surg. Clin. Chicago*, 1920, iv, 1139.

In 1916 Speed described an operation for the temporary relief of paralysis of the musculospiral nerve. This operation was devised in France during the war and was intended for the treatment of suppurating wounds which precluded early nerve suture. The new method described in this article Speed believes has more advantages than the operation previously recommended.

The flexor carpi ulnaris, supplied by the ulnar nerve, takes over the work of the extensors, including the thumb. The flexor carpi radialis, supplied by the median nerve, acts vicariously for the extension and abduction of the thumb, and the supinator, which is supplied by the ramus profundus of the musculospiral nerve, takes up the slack of the belly of the common extensors and reinforces the normal action which has been established by the transplantation of the flexor carpi ulnaris at the wrist.

The technique of the operation is described in detail.

E. C. ROBITSHEK.

**Whitman, R.: The Abduction Treatment of Fracture of the Neck of the Femur.** *N. York State J. M.*, 1920, xx, 386.

The abduction method utilizes the mechanics of the joint to correct deformity and to fix displaced fragments in apposition. The patient under anesthesia is placed upon a pelvic support provided with a perineal bar. If the fracture is complete, the shortening is reduced by direct manual traction on the extended limb after the trochanter has been lifted to the normal plane and at the same time rotated inward so that the fragments are opposed. Both limbs, extended and under manual traction, are then abducted to the full limit, on the sound side first, to demonstrate the normal range and to balance the pelvis. When this limit is approached on the injured side the tension on the capsule brings the fragments into alignment in a horizontal plane and finally forces the neck fragments against the inner and resistant head fragment. A long plaster spica is then applied which, by fixing the limb in complete abduction, extension, and slight inward rotation, insures the continued effectiveness of the anatomical splinting.

If the fracture is incomplete or impacted, the neck in its relation to the shaft is usually displaced backward and forward, and whenever the deformity is sufficient to impair the normal range of motion seriously it should be corrected. The displaced neck is in a relation to the acetabulum which, under normal conditions, would require abduction and inward rotation of the shaft. To correct the deformity, therefore, one must adjust the shaft to the neck by inward rotation and abduction of the limb.

The subsequent treatment is the same for all forms of fracture, i.e., the head of the bed is raised to increase the blood supply to the fracture area and



thus favor repair. The patient may be turned from side to side or completely over to the ventral position without danger, and may be transported daily to the open air. The spica is retained for from eight to twelve weeks or until it may be assumed that union is sufficiently firm to permit movement of the limb. The patient then should remain in bed, if possible, and devote several weeks to muscle re-education and the restoration of motion in the joints. Weight-bearing should not be permitted until free and painless movement and the X-ray examination indicate stability of repair. If early locomotion is desired a protective hip brace should be provided.

The advantages of the abduction method are: (1) the patient does not require hospital treatment, (2) the apparatus necessary is simple and may be improvised, (3) the qualifications of the surgeon are not exacting.

Advanced age does not contra-indicate the use of this method for the author believes that the efficient treatment of the fracture lessens rather than increases the danger to life.

The traction method of treating fracture of the neck of the femur is unreliable as it does nothing more than relieve symptoms and results in functional disability due to uncorrected deformity. The mechanism of the abduction treatment is the anatomy of the hip joint, and the limb is fixed in the attitude which makes the internal splinting effective.

R. S. REICH.

**Robert, A. E.: The Treatment of Diaphyseal Leg Fractures by Encircling the Tibia According to the Putti-Parham Method** (Le traitement des fractures diaphysaires de la jambe par le cerclage du tibia suivant la méthode de Putti-Parham). *Rev. méd. de la Suisse Rom.*, 1921, xl, 782.

This article deals with the treatment of oblique or V-fractures of the tibia which occur at the juncture of its middle and lower thirds, the weakest point. In such a fracture with great displacement the different methods of reduction which have been devised give only imperfect results. When there is much displacement, therefore, the author prefers osteosynthesis effected by encircling the tibia with a metal strip according to the Putti-Parham method. This operation is best done between the fifth and the seventh days following the traumatism.

The only inconvenience due to the method is that long after recovery there may be a slight reaction due to the retention of the metal strip. This is very rare, however, and when it occurs an opening may be made under anæsthesia and the metal strip removed as it is no longer required. The advantages of the method are summarized as follows:

1. It prevents pseudarthrosis due to muscular interposition which is frequent in oblique fractures with marked displacement of fragments.

2. The patient is able to walk with the aid of Delbet's apparatus in about three weeks.

3. The immediate functional results are better than those obtained by any other method. There is no shortening, the static axis is normal, and there is no stiffness of the tibiotarsal articulation.

4. Sequelæ such as persistent œdema and vascular and nerve disturbances are prevented.

W. A. BRENNAN.

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Bosch Arana, G.: Osteosarcomata of the Radius Treated by Resection and Fibular Grafts** (Osteosarcomas del radio tratados mediante la resección y el injerto óseo peroneal consecutivo). *Semana méd.*, 1920, xxvii, 601.

The author treated two cases of osteosarcoma of the radius by resection of the tumor *in toto*, sectioning the bone in healthy areas and removing the mass without opening it. Later the bone deficiency was replaced by a bone graft taken from the leg.

Both tumors were encapsulated. In the first case the graft was placed forty-five days after the primary operation for the removal of the tumor. In the second case the tumor was completely removed and the graft cut and placed during the same operation. In both instances the graft took and good function of the fingers was obtained. In the first case, however, there was some tendency to external subluxation of the carpus. This was remedied by a slight operation. In the second case the graft was displaced by a pseudarthrosis which developed between the graft and the radius. The author endeavored to overcome this defect by means of a periosteal graft taken from the ulna. He was not successful, however, and the patient is obliged to wear an orthopedic brace.

The conservative treatment of osteosarcoma by resecting the tumor and bone grafting is applicable only to cases of encapsulated tumors. When the soft parts are invaded amputation is indicated.

W. A. BRENNAN.

**Ely, L. W.: An Operation for Tuberculosis of the Wrist.** *J. Am. M. Ass.*, 1920, lxxv, 1707.

The author refers to a cardinal rule which he laid down ten years ago that the proper way to cure a tuberculous joint in the adult is to destroy it.

In the operation described an incision 8 to 10 cm. long is made from the middle of the third metacarpal bone to a point 4 cm. proximal to the wrist joint on the radius, passing over the wrist at about its center. The incision is deepened and the extensor tendons are retracted. The periosteum is also incised and stripped back. With a motor saw two parallel cuts 5 cm. long and 5 mm. wide are made, running through the wrist joint into the radius and into the third metacarpal bone for a distance of about 1 cm. A graft measuring 4 by 0.5 cm. is then taken from the tibia and fitted into the groove. When the wrist is forced into extension the graft locks fast. The graft is sutured in place and



the skin is closed. The wrist is fixed in hyper-extension in plaster of Paris with the fingers and thumb free. Considerable swelling need cause no anxiety if the plaster dressings are slit. Fixation of the wrist should be maintained for about three months.

The result is a useful hand possessing as much rotation as before the operation and excellent power in the fingers and thumb.

Ely reports two cases in which he has obtained very good results with this operation.

F. G. MURPHY.

**Kanavel, A. B.: 'The After-Treatment of Infections of the Hand. *Surg. Clin. Chicago*, 1920, iv, 1165.**

According to Kanavel the most valuable asset of the working man is his hand. Therefore, in infections of the hand it is the surgeon's duty not only to control the infection, but to see that proper and adequate after-treatment is carried out. The first consideration in the operative treatment of infections of the hand is to make incisions in the proper location and of sufficient length to evacuate the pus. Of equal importance in the restoration of function is the after-treatment, which involves the use of active and passive motion, hot baths, dry heat, massage, suitable splints, and other mechanical aids.

In this article Kanavel reports 3 cases of hand infection. The first patient came to him five days after the development of an infection of the tendon sheaths of the thumb and little finger which rapidly involved the ulnar and radial bursæ and was followed by the formation of a secondary abscess in the forearm. An operation was performed and after-treatment immediately instituted, with the result that the patient is now able to extend and flex fully all the digits except the little finger. He has no limitation of motion at the wrist, and except for slight limitation of extension of the little finger which does not incapacitate him, he has regained complete function of the hand.

The second patient suffered from a severe infection of a similar nature which had been treated by inadequate incision and without adequate care after operation. He came to the author about a year after the infection with extensive adhesions and contractures.

The third patient suffered from a similar trouble but it did not involve the whole hand.

Clinically there are two common types of hand infections, those due to the streptococcus and those due to the staphylococcus and similar organisms. In both types it is of the greatest importance that active and passive motion should be begun as soon as possible after drainage has been instituted. In a case of staphylococcus infection the patient should be urged to use his fingers for ten or fifteen minutes two or three times a day—flexing, extending, adducting, and abducting them—at the end of thirty-six hours or, at the most, forty-eight hours. If the infection is due to the streptococcus it may be advisable to delay active and passive motion for twenty-four hours

more. If the patient's temperature should rise after manipulation of the hand, passive and active motions should be delayed for another twenty-four hours and then carried on very gently.

After forty-eight or seventy-two hours an arm bath, large enough to permit complete immersion of the hand and forearm, may be substituted for the hot dressings used immediately after operation. The entire hand and forearm should be kept in the bath for twenty minutes two or three times a day, during which time the patient should move his fingers both by active contraction of the muscles and with the help of the other hand. The water should be as warm as can be borne comfortably.

At the end of from four to six days it will be found advisable to decrease the interval during which the hand is immersed and to expose the infected hand immediately after the bath to the rays of an electric light which will thoroughly dry the skin.

If the original incision has been so made that the tendons have a tendency to prolapse, it is advisable to apply a dorsal splint during the time that the hand is not being exercised. In the author's opinion the commonly seen permanent flexion at the wrist joint, particularly that associated with adduction or abduction, is due to the fact that the patient's hands were bound up for a considerable period of time with dressings and no attention was paid to proper after-treatment.

Within ten days or two weeks it will be found that the methods outlined do not adequately meet the problem in these cases. In order to maintain the patient's interest and to ensure steady progress in the restoration of function the use of a number of various mechanical devices has been suggested. Among the most valuable devices available are the different types of rollers for the patient to rotate so as to raise or lower the weights which are attached. Those constructed of cylinders of varying sizes are the most effective as the patient is constantly encouraged to flex his fingers about the smaller cylinders. Another valuable device is a glove so constructed that it holds the fingers in a position which prevents contraction in an improper position and permits the patient to grasp different types of objects.

For exercising the fingers, practising on the piano or typewriter is particularly valuable. For exercising the fingers and wrist, tennis, Indian clubs, hand-ball, golf, indoor ball, volley ball, and bowling are helpful.

When there are abscesses in the hand which do not involve the tendons it is possible to secure complete restoration of function within a month. When the tendon sheaths have been involved, a longer period of time is generally necessary if there has been delay in the treatment; 85 per cent of function should be secured within four months, 95 per cent within six months, and in favorable cases 100 per cent within a year.

Another group of patients are those with infections in the hand which have been improperly treated and



who present themselves with stiff, claw-like fingers and hands, ankylosis at the joints of the hand and wrist—in short, with an insensitive and an altogether useless member.

In such cases the median and ulnar nerves are frequently involved in the suppurative process. In the more complicated cases the tendons at the wrist joint will be found to be one indistinguishable mass of scar tissue.

Operative treatment should not be attempted unless the surgeon has accurate knowledge of the anatomy of the hand, particularly the distribution of the nerves and the relations of the nerves and tendons. It is not wise to promise a patient any benefit from the operation. It is better to promise little and do more than to promise much and do less.

G. W. HOCHREIN.

**Descomps, P.: Section of the Soft Parts and the Bone in Limb Amputations** (Taille des parties molles et taille du squelette dans les amputations des membres). *Rev. de chir.*, Par., 1920, xxxix, 379.

Removal of a limb presents a double problem: section of the soft parts and section of the bones. Usually the two procedures are considered as closely related, a certain method of sectioning the soft parts being always thought of in connection with a certain method of sectioning the bone. This assumption robs amputation of much of the elasticity which is desirable.

For every region of the limbs there is in reality an optimum method of sectioning the soft parts and an optimum method of sectioning the bones, and these do not necessarily correspond.

From this point of view the author discusses at length and illustrates amputations in various portions of the upper and lower limbs based particularly on experience gained during the recent European war.

W. A. BRENNAN.

**Hedri, A.: The Treatment of Transverse Nerve Sections in Amputation Stumps** (Zur Behandlung des Nervenquerschnittes bei Amputationsstumpfen). *Muenchen. med. Wchnschr.*, 1920, lxvii, 1148.

Following the amputation of an extremity unpleasant sensations are often referred to the fingers or toes and may become aggravated into severe pain. Investigations carried out by the author have shown that if these sensations come on early after an amputation they will probably persist and prevent the use of an artificial limb as even touching the stump elicits lightning-like pain in the extremity. Wilms attributes this sensibility to the secretion present in wounds not healing by primary intention which irritates the nerve ends.

Until the neuroma formation of cut ends was recognized the later sensibility of stumps was attributed to scar involvement of the nerve ends. Krueger has shown that the important factor is the defect in the nerve sheath which does not regenerate

with the regeneration of the nerve fibers so that the nerve is not surrounded by perineurium. To remedy this many methods have been devised. Krueger recommends the crushing of the nerve stem to prevent the growth of the axis cylinder beyond the nerve sheath. This method has been used extensively but as it also may fail the author presents a new method which prevents neuroma formation entirely or delays it at least until the wound is healed. He accomplishes this by burning the nerve ends with the thermocautery and sparing the less sensitive perineurium.

Following this procedure a scab forms on the nerve fibrils so that the nerve ends are protected from the irritating wound secretion and the regeneration of the nerve fibrils is delayed until complete healing of the wound has taken place. Hedri has obtained excellent results with this method. Laewen's ice method has also given good results but is unsatisfactory in the treatment of larger nerves as the cold does not penetrate sufficiently.

GÄNGEL(Z).

**David, V. C.: The Treatment of Acute Suppurative Arthritis of the Knee Joint.** *Surg. Clin. Chicago*, 1920, iv, 1253.

The case reported was that of a laborer, 40 years of age, who entered the hospital because of bilateral swelling of the knees and the legs below the knees which came on just as an attack of bronchopneumonia was subsiding. The swelling was acute in onset and was associated with marked pain on movement.

The patient's temperature was slightly elevated and his pulse rate varied from 100 to 110. On examination of the chest a few râles were heard over the base of both lungs, but there was no evidence of consolidation. The urine was negative and the leucocyte count 14,000. Both knees were markedly swollen, but the skin was not reddened. On both sides the patella was floating and the quadriceps bursa was so distended that it could be plainly outlined up to the lower third of the thigh. Below the knees, the legs and ankles were swollen. The ankles were painful on motion, but no fluctuation was present over them. The skin was not hyperæmic, but pitted easily on pressure. An aspirating needle attached to a Luer syringe was inserted into each knee joint, beginning high up along the outer aspect. On both sides a creamy yellow pus was withdrawn which on culture showed colonies of streptococcus hæmolyticus.

A long parallel incision was then made on both sides of the patella, beginning just below the inferior border of the patella and extending to the upper limit of the quadriceps bursa. Each incision was about 8 in. long. The blood vessels in the cut quadriceps muscle were cut and ligated and into each wound a long strip of vaselined gauze was inserted to prevent the recently cut edges from adhering to each other and thus obstructing drainage. No drainage material was put into the joint. A gauze dressing



was placed over the wound and a towel slipped under the knee and loosely pinned over the dressing. Each knee was supported in a Hodgen splint which was slightly bent, and both splints were suspended on a Lyle frame and counterpoised so that the patient could raise himself up without bending the knees. To facilitate motion of the joints an adhesive plaster strip was attached to the sole of each foot and connected with a pulley on the frame by a rope. This rope was run through another pulley just above the patient's head and then allowed to hang down so that the patient could reach it with his hand. By pulling on the rope the knees could be extended in the Hodgen splints.

In ten days the knees were taken out of the splints and allowed to rest on the bed. The adhesive was removed from the soles of the feet and the rope upon which the patient pulled to exercise the knees was attached to a canvas which ran under each knee. Traction on the rope caused flexion of the knee. At the end of three months the knees had about 40 degrees of flexion and full extension.

G. W. HOCHREIN.

**Elmslie, R. C.: The Principles of Treatment of Congenital Talipes Equinovarus. *J. Orthop. Surg.*, 1920, n.s. ii, 669.**

The author emphasizes two points in the treatment of congenital talipes. The first is that more consideration should be given to the resulting functional use of the foot than to the apparent correction of the deformity, and the second, that when a cutting operation is necessary the procedure adopted should be based upon the known pathological anatomy of the deformity. In Walsham's description of the pathological anatomy cases are grouped into two classes: (1) cases of congenital club-foot in children who have never walked, and (2) cases of relapsed and inveterate club-foot in which the foot has been walked upon in the deformed position.

The chief factor in the various types of deformity is displacement of the scaphoid and cuboid inward at the mid-tarsal joint with rotation of the os calcis bringing its anterior extremity downward and inward. The astragalus lies in a position of plantar flexion at the ankle joint. The most striking abnormality is increased obliquity of the neck of the bone downward and inward. The degree of this obliquity may be measured. The os calcis lies obliquely. Its posterior end is tilted upward and outward so that it lies nearer the external malleolus than in the normal foot. The anterior extremity points downward and inward and is twisted so that the outer surface lies underneath. The articular facet for the cuboid, therefore, points more inward and downward and less directly forward than in the normal foot.

This description applies to the chronic club-foot in which the varus element of the deformity is due in large part to subluxation inward of the scaphoid and cuboid and in smaller part to an alteration in

shape in the astragalus and os calcis. The author discusses here the importance of the ligamentous structures in reference to the deformity, especially the astragalo-scaphoid capsule.

In the club-foot of the young child the changes mentioned are all present. In the infant most of the deformity is due to the displacement at the ankle joint, subastragaloid joint, and midtarsal joint, only a small part being due to changes in the neck of the astragalus in the anterior part of the scaphoid. Resistance to correction is formed largely by the astragalo-scaphoid capsule, the plantar fascia, and the tendo achillis. In inveterate cases the importance of the astragalo-scaphoid capsule is very much greater, and, in addition, the displacement of the anterior articular fascia of the os calcis on the inner side of the bone is very important because of the difficulty of replacing the cuboid on the os calcis.

Regarding treatment the author claims that tenotomy has been too freely employed. In most of the cases of children under 1 year of age correction can be obtained by simple manipulation under an anæsthetic, repeated if necessary several times, and retention of the foot in plaster of Paris between manipulations. Elmslie describes his method of manipulation and application of plaster of Paris in detail.

It is essential that the steps in the correction of club-foot should be in the order described. First, the sole should be flattened. The abduction of the fore part of the foot must be completed before the equinus portion of the deformity is corrected. This last is very important. Premature correction of the equinus by division of the tendo achillis leaves an imperfect foot which is very apt to relax and exceedingly difficult to correct satisfactorily by any subsequent operation.

Relapses occur in the practice of all surgeons, and are due either to imperfect correction or to inadequate attention to the after-treatment. As a rule a relapse is due to failure to overcorrect the varus part of the deformity in the first stage of the treatment. The author cites the various accepted methods of treating relapsed cases of club-foot. Many of them he criticizes as too radical and destructive. Phelps' operation is especially cited. Astragalectomy (Lund) Elmslie considers an operation of poor judgment as it is a well-known fact that following this procedure the foot has a tendency to turn to the varus position.

The method of treatment advocated by Elmslie in cases of severe club-foot in older children or adults is as follows:

At one or two sittings an attempt is made to manipulate the foot into shape until the maximum correction has been obtained. As soon as this is evidenced, an open operation is performed to remove all obstruction to complete correction of the varus part of the deformity. The obstructions are: (1) the astragalo-scaphoid capsule, including the anterior part of the interior lateral ligament and the



attachment of the tibialis posticus tendon, (2) the displacement inward of the cuboid on the os calcis, and (3) the inward and outward obliquity of the neck of the astragalus and the anterior part of the os calcis.

In concluding his article Elmslie again emphasizes the importance of avoiding division of the tendo achillis and the fact that the Phelps' operations, astragalectomy and tarsectomy, are unjustifiable. Astragalectomy is an operation which is based on unsound ideas regarding the pathology of the condition.

L. D. PRINCE.

#### ORTHOPEDICS IN GENERAL

**Scheimberg, H.:** *The Weak Foot in the Child.* *N. York M. J.*, 1920, cxii, 988, 1026.

Persistent pain is often absent in weak foot in childhood. This is in a way unfortunate because attention is not drawn to the condition. When pain is present it is usually regarded as "growing pain." Such objective symptoms as round shoulders, protruding abdomen, clumsiness in action, and frequent falling are often associated with weak feet and are more prominent than the foot symptoms.

In the treatment, operative surgery is contraindicated, not only because of the danger of interfering with bone growth but because excellent results can be obtained by more conservative measures. The use of plaster of Paris or adhesive plaster to hold the foot in supination is also unnecessary because there is no shortening or spasm of the peronei muscles and such immobilization defeats the possibility of restoring function which is best secured by mobilization.

Successful treatment demands attention to: (1) attitude, (2) footgear, (3) exercises, and (4) the prevention of deformity.

Improper standing or walking may be secondary to postural defects other than those of the feet.

Flexible shank shoes and sandals are not indicated for the foot of a child. The contention that such shoes are rational because they allow natural function of the foot does not take into account the fact that most of our walking and standing is done on hard pavements not designed by nature. Proof is lacking that a well-fitted rigid shank shoe interferes with function. In addition to a properly fitted shoe which does not cause abduction of the great toe, the stocking also should be fitted with the same object in view. In weight-bearing the great toe naturally tends to adduct somewhat from its relaxed position because of contraction of the flexor longus hallucis. Most stockings tend to prevent this adduction. The ideal stocking should have a separate stall for the great toe.

Exercises should have for their object the inversion of the entire foot at the ankle and adduction of the forefoot. It is a good plan to make them interesting to the child in various ways such as having him rotate the foot around the nurse's finger. Special care should be taken to have the

feet exercised either actively or passively if the child is confined to bed on account of illness. This is necessary in order to preclude an equinus deformity due to continued extension.

In some cases physiological treatment cannot check a faulty balance. Resort must then be had to the use of rigid supports to restore the balance, discarding them after this aim has been attained. A metal support should produce pressure on the inner upper and lower outer aspects of the os calcis. The Whitman plate made over a plaster model of the foot is recommended for this purpose.

W. A. CLARK.

**Clark, W. A.:** *A System of Joint Measurements.* *J. Orthop. Surg.*, 1920, n.s. ii, 687.

In the literature the limits of motion and angles of deformities in joints are expressed variously. It is often impossible to say whether the angle mentioned is the angle included between two bones or the angle between one bone and an imaginary line projected from the other; the record is often ambiguous. Hence Clark attempts to standardize the measurement of angles in joint deformities by a rational system in which the arc of the angle included between the bones on either side of the joint is used to express the limits of motion or the angles of deformity, complete extension being 180 degrees. Any movement beyond 180 is recorded as hyperextension and regarded as analogous to flexion but in the opposite direction. Such movement may be expressed, for example, as "hyperextension to 170 degrees."

In this system the stated number does not represent the number of degrees through which the part has moved, but the angle on the scale from 0 to 180 where it stops, i.e., it indicates the limits of motion but not the amount.

Flexion is the movement in an anteroposterior plane in the direction of its greatest range, beginning at 180 and approaching 0; for example, "flexion to 80 degrees." Abduction starts at 180 and implies a movement away from the median line of the body in an arc approaching 0; for example, "abduction of the thigh to 110 degrees." The angle measured is that included externally between the member moved and the cephalic part of a line passing through the joint parallel with the median body line.

Adduction is a movement from 180 degrees toward the median body line and the angle measured is that included internally between the member moved and the cephalic part of a line passing through the joint parallel with the median body line. Rotation is measured on the anterior half of a circle whose center coincides with the axis of rotation and whose plane is perpendicular to that axis, with the scale running from 0 on the inner side to 180 degrees on the outer, thus making the internal-anterior angle the angle measured. Measurement is made at the distal end of the bone rotated, such as the femoral condyles in the case of



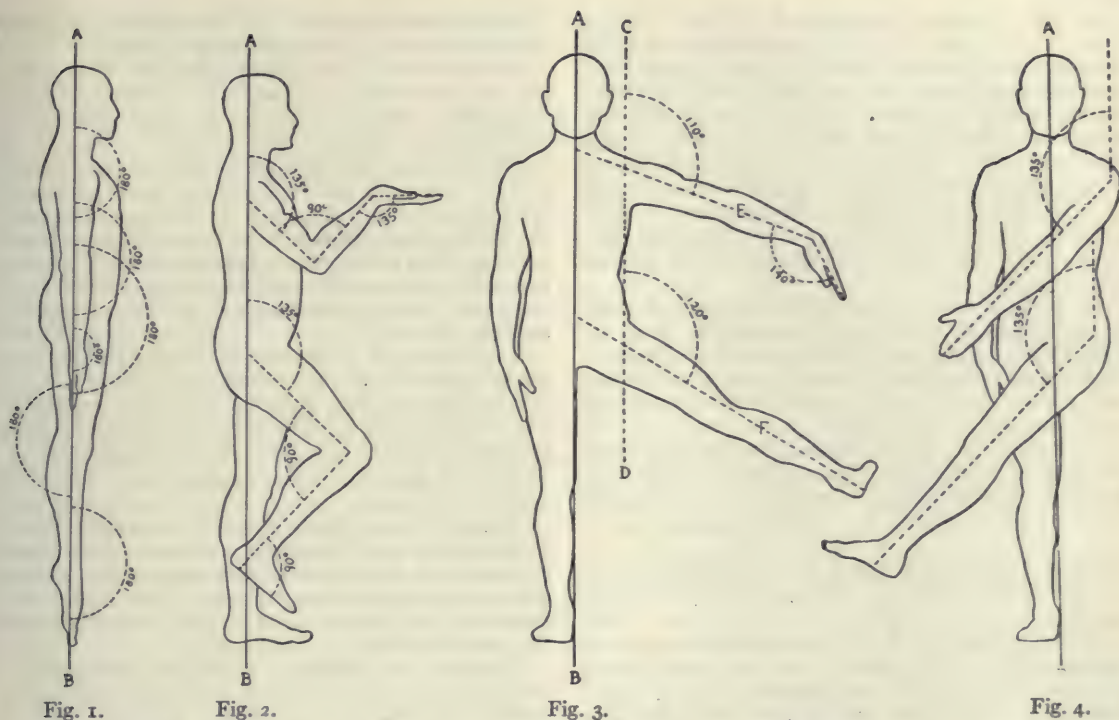


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 1. Neutral position, complete extension of all joints.

Fig. 2. Flexion, shoulder to 135 degrees, elbow to 90 degrees, hip to 135 degrees, knee to 90 degrees, ankle (dorsal flexion) to 90 degrees, hyperextension of wrist to 135 degrees.

Fig. 3. Abduction, shoulder to 110 degrees, hip to 120 degrees, flexion of wrist to 140 degrees.

Fig. 4. Adduction, shoulder to 135 degrees, hip to 135 degrees.

the thigh. The radius is an exception because its axis of rotation passes through the lower end of the ulna. Here the indicating line for recording rotation of the forearm is the external projection of the lateral line of the radio-ulnar styloids, complete

supination thus registering 180 degrees and complete pronation about 45 degrees.

The article is concluded with tables giving the normal limits of motion in each joint as obtained by active movements.

R. G. PACKARD.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Giannuli, F.: Pseudo-Syringomyelia and Chronic Poliomyelitis** (*La pseudo-siringomielia e la poliomielite cronica*). *Policlin.*, Roma, 1920, xxvii, sez. med., 441.

The author observed the case of a man 64 years old who, at about his thirtieth year of age, had presented a syndrome of symmetrical dystrophy of the limbs resembling progressive muscular atrophy of the Aran-Duchenne type. When seen by the author the syndrome presented was that of muscular atrophy of all the limbs due to an affection of the nerve roots and a manifest degenerative reaction which in the upper limbs involved the shoulder girdle and in the lower limbs was responsible for equinovarus position of the feet. The condition had persisted for forty years. This article is based particularly on the peculiar anatomopathologic findings obtained at autopsy.

The case had been diagnosed as syringomyelia, but this diagnosis was incorrect as the histopathologic characteristics of the disease showed that it was chronic poliomyelitis.

The histologic study of the author's case leads him to the following conclusions:

1. There is a form of very chronic poliomyelitis which is characterized by a mesodermal hypertrophic inflammation, hæmorrhage, extravasation, thrombosis, ischæmic foci usually in the gray matter of the spinal medulla, and secondary atrophic degeneration of the cells and nerve fibers. The ependyma of the central canal is not involved in the inflammatory process.

2. This type of disease occurs between the thirty-seventh and fortieth years of age, and runs a very chronic course which may persist from thirty-five to forty years.



3. The etiology is obscure.

4. On the basis of the empirical character of the autopsy findings and especially the presence of numerous medullary cavities, the condition might be considered a variety of syringomyelia but the histologic character of the anatomical processes shows that it is a variety of chronic poliomyelitis.

5. The clinical syndrome in relation to the site of the anatomical process resembles that of progressive muscular atrophy of the Aran-Duchenne type associated with disturbances in the general sensory system.

6. From the anatomopathologic point of view the presence of cavities in the medulla is of no significance in defining a disease entity; therefore, this of itself cannot define syringomyelia, a disease which has a specific anatomopathologic picture and a specific clinical syndrome.

7. Besides true or gliomatous syringomyelia there are false syringomyelias (hydromyelia, hæmatomyelia, etc.) which have an intimate anatomical and clinical relationship to it. W. A. BRENNAN.

**Morgan, I., and Roberts, A. T.: Endothelioma of the Cauda Equina.** *Med. J. Australia*, 1920, ii, 533.

The case reported by Morgan and Roberts was that of a laborer, 46 years old, who was admitted to the hospital May 21, 1920, complaining of "lumbago and sciatica," of three years' duration. The pain had been confined to the lumbar regions and thighs on both sides. Three months before the patient's admission to the hospital he noticed that his legs were becoming weak. This weakness increased until he was unable to walk without crutches. He complained also of numbness in the right thigh and left leg and incontinence of urine.

The pupils were found to react to light and accommodation. The cranial nerves appeared to be normal. Sensation, motor power, and the reflexes of the upper extremities and trunk were also normal. There was incontinence of urine and loss of control of the anal sphincter. The skin areas supplied by the fifth lumbar and the first, second, and third sacral nerves on the left side and the first, second, and third sacral nerves on the right side were completely anæsthetic. The knee jerks were absent. There were no plantar or patellar reflexes. No ankle jerks were present. Voluntary movements involving the thigh muscles could be performed easily. There was double foot-drop and complete loss of movement on both sides at the ankle joints and all of the joints of the feet and toes.

The other systems were normal except that well-marked emphysema was present. The urine was alkaline and had a specific gravity of 1.025. A deposit of triple phosphates was noted.

The blood serum failed to fix complement in the Wassermann test.

Lumbar puncture yielded fluid not under pressure containing 25 lymphocytes and 100 leucocytes per cubic millimeter.

A diagnosis of tumor of the cauda equina was made and a surgeon called into consultation.

Two important points were considered in discussing the advisability of operation: (1) the accessibility of the tumor, and (2) the accurate localization of the lesion.

At operation the laminae of the second, third, fourth, and fifth lumbar vertebrae were removed, exposing the dura. The dura was seen to be pulsating in the upper portion of the cord, but the lower portion lying on the third, fourth, and fifth lumbar vertebrae was firm in consistency and showed constrictions which corresponded to the vertebral arches.

A longitudinal incision 6.25 cm. in length was made in the dura. An adenomatous mass bulged through the incision. By blunt dissection the tumor was shelled from its bed and separated from the constituents of the cord. It extended from the third to the fifth segments and completely filled the spinal canal in this area.

The bleeding at this stage was extremely difficult to control and the escaping cerebrospinal fluid made it impossible to determine the amount of involvement of the nerve roots clearly. The tumor appeared to shell out cleanly from the constituents of the cauda equina.

The incision in the dura mater was closed with a continuous catgut suture and the wound closed with drainage into the upper portion.

The wound healed by first intention. The pathologist reported the tumor to be an endothelioma.

On August 4, 1920, voluntary movements and sensation in both legs and control of the anal and vesical sphincters were returning.

The authors believe that in time, with massage and suitable movements and exercise, function may be restored to the lower limbs.

MARGARET I. MALONEY.

**Silfverskiöld, N.: Traumatic Scoliosis** (Ueber traumatische Skoliosen). *Arch. f. Orthop.*, 1920, xvii, 503.

Among 891 cases of scoliosis, 32 (3.6 per cent) showed signs of trauma. One-third of these patients were between 14 and 17 years of age. The author does not give the case histories, but shows photographs of a few patients with very marked deformity. He points out that it is impossible to prove a definite relationship between trauma and scoliosis. On the other hand, observations of Kuemmel's deformity indicate that definite changes in the shape of the vertebral column may follow trauma. Traumatic scoliosis resembles Kuemmel's deformity as in both conditions there is a sharp kyphosis and the complaints are similar. On the basis of a study made by Lange of an injury of the vertebral column, the author concludes that trauma may reduce the strength of the bones even when there has been no bone injury. In this way he explains traumatic scoliosis as a "burden-scoliosis."

PORT (Z).



Calvé, J., and Galland, M.: *The Treatment of Pott's Disease by Osteosynthesis* (De l'ostéosynthèse dans le traitement du mal de Pott). *Rev. de chir.*, Par., 1920, xxxix, 340.

The scope of the authors' article comprises:  
 1. A review of the pathologic anatomy of Pott's disease and the conditions which precede its development.

2. An attempt to establish the elements of vertebral statics in Pott's disease; to determine the nature of the forces which are applied to a graft implanted in the spinous processes of a tuberculous vertebral column; and to deduce from these facts the value of the operations now performed for the treatment of Pott's disease.

3. A critique of the methods of treatment in actual use and a discussion of other techniques and indications.

Regarding the pathologic anatomy the authors state that the vertebral column has a sustaining or weight-bearing function which is attacked directly by Pott's disease. The principal cause of aggravation of the condition is pressure necrosis. Solid functional and anatomical recovery is obtained by orthopedic treatment only when bony contact is assured. Orthopedic treatment gives excellent results, but these are late. A child may recover entirely, but an adult is always apt to suffer a recurrence.

The evolution of Pott's disease profoundly modifies the vertebral statics from the beginning. The disease divides the spine into two segments acting on each other in a state of unstable equilibrium at the level of the lesion. In this area the superior articular facets rest upon the points of the subjacent articular processes in the same way as the beam of a balance rests on the knife-edge supporting it.

Under classical orthopedic treatment total recovery with minimum of deformity may follow in the case of a child in from three to five years. In the adult under the same treatment a partial recovery of

function may be obtained in about two years but relapses are frequent.

The authors' study of the mechanical forces coming into action in Pott's disease shows that the principal force exercised causes elongation. With this is associated an element of scoliosis which is secondary and dependent upon the degree of the displacement of the spinous processes. A rigid graft is able to oppose this elongation only slightly.

In the rigid graft there are three segments to be considered: the segment corresponding to the lesion subjected to a force of elongation and secondary scoliosis; a segment suprajacent to the lesion in which the graft opposes only the normal physiological flexion of the corresponding normal elements; and a segment subjacent to the lesion in which the graft may act as in the suprajacent segment but has not undergone any transformation. These considerations lead the authors to suggest the use of a short graft which is limited in length to the segment recognized as useful and corresponds to the level of the injured vertebrae.

In the authors' opinion it is not probable that osteosynthesis can be substituted for the classical treatment in Pott's disease in the course of development. It does not keep the involved vertebrae from tending toward bony contact and does not prevent pressure necrosis, the principal cause aggravating Pott's disease. This opinion refers to osteosynthesis effected by the Albee or the Hibbs method. In the child a long graft implanted at the beginning of the disease seems useless as it is incapable of counterbalancing the action of the weight of the body and of opposing scoliosis. Moreover it is harmful because it opposes the slow and progressive orthopedic corrections which are effected in the course of the classical treatment. Osteosynthesis in the child is useless after recovery because bone function is re-established in healthy tissue. In the adult osteosynthesis effected by the use of a long graft is an excellent operation complementing the classical treatment.

W. A. BRENNAN.

## SURGERY OF THE NERVOUS SYSTEM

**The Diagnosis and Treatment of Peripheral Nerve Injuries.** *Report of Committee on Injuries of the Nervous System. Medical Research Council, Lond., 1920.*

Most cases of injury to the peripheral nervous system make a good recovery provided treatment is carried out systematically and continued over a long period of time. An exact knowledge of what nerve or nerves are injured as well as the site of the lesion is essential before treatment is begun, and at the same time an accurate record of motor, sensory, and nutritional changes present should be made.

Stress has been laid on the need for thorough collaboration between the surgeon, masseur, and patient, and on the fact that no operation, however skillfully performed, can ensure success unless the

treatment which precedes and follows it is planned carefully and carried out with intelligence.

In testing for motor function care should be exercised to guard against trick movements produced by the use of other muscles to move a joint such as occur in musculospiral paralysis when the patient flexes his fingers at the metacarpophalangeal joint through the action of the lubricals which shorten the long extensor tendons and produce extension at the wrist.

Electrical response alone is not sufficient to reveal the condition of the nerve under examination, but electrical stimulation should form part of the routine examination in all cases of suspected nerve injury. It is of the greatest assistance in testing certain muscles or muscle groups, such for example as the



small muscles of the hand and foot and the muscles of the forearm.

As an immediate preliminary to electrical tests the limb or part to be examined must be warmed and any oedema which is present should be reduced as far as possible by massage. The nerve and muscle are first tested for faradic excitability and, if this is present, no further electrical examination is necessary. Much stress is sometimes laid on polar changes, but these are inconstant and have little or no clinical value. The presence or absence of faradic response is the important factor and in the great majority of cases forms a trustworthy index of the condition of the nerve.

An improvement in the galvanic response may be brought about in the absence of nerve recovery by nutritional treatment. The state of the muscle improves with massage, the application of heat, and galvanic stimulation, but this must not be regarded as evidence of definite recovery.

Warnings are given as to the methods of testing sensibility as misleading information may be obtained if care is not used.

Tests with heat and cold are difficult to carry out in cases of lesions of the peripheral nerves, and contribute little of practical value.

When a nerve is completely divided, that part of the skin which is analgesic becomes inelastic and puckered and does not sweat. It feels colder than the surrounding normal skin and desquamation is retarded so that the surface becomes scaly and loaded with heaped-up epithelium. In the color of the skin there is always a bluish tint which becomes deeper in cold weather or when the part is allowed to hang down. Dependence of the limb leads to swelling. In the analgesic area the tissues are liable to injury, and unless the part is protected, ulcers which are slow to heal readily develop.

When there is complete nerve division vasodilation is a paralytic phenomenon, but when the interruption in conduction is incomplete and the injury is associated with severe and continuous pain, as in causalgia, dilatation of the vessels is due probably to the vasodilators. The nerves with injury of which causalgia is usually associated are the median, sciatic, and ulnar. Sensibility is not abolished, there is little or no paralysis, but the hand or foot may become seriously deformed.

In extreme cases of causalgia the skin is thin, smooth, and glossy. The cutaneous folds disappear and the surface may sweat profusely. When the skin remains dry, the constrictors are probably destroyed. The skin may have the appearance of wash leather owing to the fact that the patient tends to keep his hand continually moist with water to obtain relief from the pain. Sometimes the skin is a bright red or is mottled red and white. It may be tense and firm as if tightly stretched over the wasted tissues. Small vesicles containing clear or blood-stained fluid may be dotted over the surface of the hand and fingers, and chilblains is a common complication.

Characteristic changes occur in the nails. Curved longitudinally and transversely, they grow more rapidly than the nails of normal fingers; they are often thin, striated, and exquisitely tender, and the sensitive nail-beds protrude because of wasting of the finger-pads. The bones become decalcified and brittle and the fingers tapering. Movement of the hands and fingers can scarcely be tolerated, and in consequence it is extremely difficult to combat the development of fibrous changes in the joints and muscles which often leave serious deformities.

In the more chronic cases the appearance of the hand or foot may entirely change. Movement of the hand or fingers can scarcely be tolerated. The ruddy color of the skin may be replaced by pallor, and sweating is no longer observed. The affected muscles become hard and waste rapidly in spite of daily massage, and gangrenous patches may appear within the distribution of the nerve.

The failure to perform a movement may be due to arthritic adhesions or interstitial myositis. The former condition may be due to errors in treatment and especially to prolonged immobilization with splints. It is also of frequent occurrence in association with partial injuries of nerves, the best example being that provided by the median nerve. In cases of median causalgia the metacarpophalangeal joints very rapidly become fixed by adhesions with the result that no movements are possible, even when the pain has subsided and the long flexors of the fingers have recovered their functional activity.

Fibrotic changes in muscles may be due to prolonged sepsis or to interference with their vascular supply. The latter (ischaemic paralysis) may be brought about by faulty splinting or destruction of the main arterial supply of the limbs.

The treatment of cases of peripheral nerve injury during a period of observation and after operation follows similar lines. It may be considered under two headings: (1) postural treatment, (2) nutritional treatment.

The principle of treatment by posture is to relax the paralyzed muscles and thus prevent their being stretched either by the force of gravity or the pull of the non-paralyzed opponents.

It is scarcely necessary to say that splints must not be employed indefinitely. When no further recovery can be expected they should be discarded.

The treatment necessary to maintain and improve the nutrition in the paralyzed part comprises heat, massage, electrical stimulation, exercises, and re-education.

Massage should be carried out once daily for from fifteen to twenty minutes and must be sufficiently vigorous to cause pain. It is the best physical method of reducing oedema.

Electricity is of value only as a stimulus to provoke contractions in the paralyzed muscles. The weakest effective current, galvanic or faradic, should be employed.

Re-education is perhaps the most important part of the treatment. It is essential to interest the



patient in his recovery, and as regeneration advances to teach him to reproduce voluntarily those movements which have been produced by electrical stimulation. Specialized re-education becomes particularly necessary when we are dealing with the intrinsic muscles of the hand.

With few exceptions operations upon injured nerves must necessarily be of an exploratory nature. The site of the lesion and the presence or absence of conductivity in the nerve may be determined by clinical observations. In many cases the condition revealed when the nerve is exposed can be foretold with some accuracy, but it is only by inspecting, handling, and directly stimulating the nerve that its state can be ascertained with precision.

Operation is generally indicated under the following circumstances:

1. Total loss of conductivity, sensory and motor, in the area exclusively supplied by a nerve which persists after an interval of two months during which proper treatment has been carried out. This interval is an arbitrary period; it allows time for the first appearance of signs of recovery provided the lesion does not require a lengthy process of regeneration.

2. Palpable neuromata at the site of the injury of a nerve whose function is seriously disturbed.

3. When recovery has begun but has not progressed according to the usual rate or has ceased. Still more, when function has relapsed.

4. Persistent, severe, intractable pain.

The contra-indications are:

1. The presence of an unhealed wound. This should be regarded as an absolute bar to successful operation upon an injured nerve. When the wound has been healed for a few weeks only, especially if bone was damaged at the time of the injury, the operation should be delayed on account of the danger of recrudescence of sepsis.

2. Progressive recovery.

3. An injury so placed as to render an operation unusually difficult or the likelihood of successful suture very doubtful.

The cutaneous incision must be so planned as either to deal radically with or to avoid the scar of the original wound, while at the same time it should provide free access to the damaged nerve for a considerable distance both above and below the site of injury. The operation must be conducted as far as possible in a bloodless field.

No attempt to examine the site of injury should be made until the nerve has been exposed both above and below that point. Before the damaged point is disturbed, the trunk above should be freed, insulated by passing a broad strip of India-rubber beneath it, and stimulated with an extremely weak faradic current, the effects being noted and recorded.

There has been considerable discussion as to whether the whole or only a part of the proximal bulb should be resected. It is probably of more importance to have the sectional area of the two surfaces which are to be sutured together as nearly as

possible of the same size and individual nerve bundles distinctly visible. The various special manoeuvres for bringing together widely separated ends which may be adopted are:

1. Loosening of the nerve in its bed for some distance, both above and below, by passing a blunt dissector along it.

2. Relaxation of the nerve by flexing or extending the joints over which it passes.

3. Displacement of the nerve so as to make it pursue a more direct course.

Whatever material is used for suturing it should be as fine as is consistent with efficiency and a material which excites the minimum amount of fibroblastic reaction around it. Fine linen thread and silk make satisfactory suture materials. Catgut as ordinarily prepared causes much more cellular reaction than either linen thread or silk, and it is doubtful whether this disadvantage is overbalanced by its greater absorbability. The passing of a central retention stitch through the thickness of the nerve is undesirable and rarely necessary. A proper approximation can be secured by suturing the edges of the sheath only. A continuous suture should never be used. The two surfaces should not be brought tightly together; regeneration takes place more easily when they are separated by a minute space.

After suture the nerve should be left lying in contact with normal cellular tissue or muscle if possible. No advantage has been shown to attend the wrapping of the nerve in artificial membranes, fat, or fascia, and subsequent explorations have not infrequently shown that in some cases these materials exert a harmful influence. The wound must be rendered as dry as possible before it is closed. The importance of careful hæmostasis can scarcely be overrated.

When it is impossible to obtain approximation of the ends of a divided nerve, the outlook is extremely unfavorable for there is at present no known method which can take its place. It is therefore of the utmost importance that every possible manoeuvre should be tried and every means for securing end-to-end approximation exhausted before resort is had to grafting. Lateral implantations and flap operations are mentioned here only to be condemned. In what is at present known regarding the processes of regeneration of nerves there is nothing to justify these procedures and no unimpeachable evidence that they have been successful. Return of function after nerve suture depends, in the first place, on the re-establishment of structural continuity between the fibers of the proximal end of the nerve and the peripheral structures.

Neurofibrils appear to grow at a fairly constant rate so that the length of time required for regeneration of a given fiber varies directly with the distance it has to travel. The shorter the course the sooner will the connection be established. It follows, therefore, that in general recovery can be expected earliest in short nerves, in cases in which the lesion



is distal, and in muscles in which the motor points lie nearest the site of suture.

The care with which the paralyzed parts are attended to during the period of waiting, before and after the operation, has a profound influence on the time necessary for the return of function after suture as well as on the completeness of the ultimate recovery. The results will inevitably be disastrous, however perfect the regeneration of the nerve may be, if the affected muscles are allowed to become wasted and stretched and the skin to remain poorly nourished because of neglect of appropriate nutritional and postural treatment.

The degree of specialization of function in different nerves and in separate muscles supplied by the same nerve has a decided bearing on recovery. The median nerve requires a longer time than the musculospiral nerve and the intrinsic muscles of the hand than those of the forearm, and recovery on the whole is less perfect.

The interval between the receipt of the wound and the operation has no influence on the time taken for recovery for as good functional results have been obtained from suture performed two or three years after the date of injury as from primary suture.

After the reunion of the ends of a mixed nerve the first evidence that function is returning is usually volunteered by the patient. He becomes aware that some change is taking place in the distribution of the nerve. The first alteration in sensation to be detected is an appreciation of pressure. The area of loss of deep sensibility then gradually diminishes. About the time that sensibility to pin-pricks returns the skin loses its cyanosis and begins to appear more normal.

This report takes up in detail the symptoms and diagnosis of injuries of the special peripheral nerves, very accurate localization methods, and the pathology and operative treatment of special lesions.

H. A. McKNIGHT.

**Berblinger, W.: Gunshot Paralysis of Peripheral Nerves and Their Operative Treatment from the Viewpoint of Anatomy** (Die Schusslaehmungen der peripheren Nerven und ihre operative Behandlung vom anatomischen Standpunkt aus betrachtet). *Fortschr. d. Med.*, 1920, xxvii, 209.

Histologic studies of gunshot injuries of nerves have shown that in the central segment progressive degenerating processes greatly delay or prevent the return of function whereas in the peripheral segment a structure persists which is not unfavorable to operative repair even years later. In addition to total and partial gunshot injuries there are also distant injuries of peripheral nerves (Perthes) and injuries due to burning by the bullet or missile.

The traumatic degeneration consists in gradual death of the torn axis cylinder with granular degeneration of the nerve fibrils. Later degeneration of the medullary sheath and Schwann's sheath occurs. The cells of the latter proliferate, show nuclear proliferation, and absorb the rests of the

degenerated myelin of the medullary sheath. This process extends for a variable distance up the central segment and, being repeated in the peripheral segment, gradually involves the entire periphery. In the zone of directly traumatized areas this process goes on more slowly and traumatic and secondary degeneration may be distinguished.

Proliferation of Schwann's cells leads to the formation of cell bands in the peripheral segment as well as in the distal end of the central stump. These are important for regeneration. From three to four months after the injury the cell bands take on a parallel course similar to that of a nerve bundle and become differentiated into an inner zone with fibrillary striping and an outer zone. This process is the preliminary step in regeneration which, according to Berblinger, may originate not only in the axis cylinder as a whole but also in any one of the fibrils making up the axis cylinder.

The development of the Schwann cell bands precedes the fibrillary process, i.e., the formation of the new axis cylinder, and recedes as the latter advances. According to Edinger, agar-filled calf arteries used to bridge the defect gave rise to a foreign-body inflammation and hindered the formation of the cell bands. Therefore the result was a failure.

In closing the portion of his article dealing with the histologic aspect of injuries of peripheral nerves the author states that the proliferated Schwann cells are not only the pathfinders for the newly formed nerve fibers but also the paths for their nutrition and, in spite of the regenerating influence of the ganglion cells, are of the greatest importance in the formation of the neurofibril complexes.

Scar excisions and operative re-union of the cut ends are occasionally done unnecessarily as many newly formed nerve fibers pass through the scar and the results of neurolysis are to be explained only by the assumption that conditions are made more favorable for the development of cell bands and fibrillation. However, as the number of spontaneous improvements following nerve injury due to gunshot wounds is small, scar resection with re-union of the ends remains the method of choice. Surrounding the nerve suture according to Borchardt's method with a sheath of fat or muscle seems efficacious.

The advisability of doing a double implantation according to von Hormeister's method is open to serious doubt as there is danger of partial paralysis of the bridging nerve. Bethes' method of bridging the defect with a section of nerve deserves consideration. While necrosis of the implanted nerve prevents the formation of cell bands, the endoneural connective tissue persists longer and unites with the endoneural connective tissue of both stumps. Theoretically at least, similar changes are possible in the formation of a flap from the peripheral nerve segment. In endoneural neurolysis according to Stoffel's method the anastomosis between the fibers of a nerve bundle may be injured. Heinecke's method of implanting the central segment into the



muscle promises good results. If no improvement is noted after three or four months operation by Perthes' method should be considered. *PLENZ (Z)*.

**Stopford, J. S. B.:** *The Treatment of Large Defects in Peripheral Nerve Injuries.* *Lancet*, 1920, cxcix, 1296.

The author presents his conclusions which are derived from investigations carried on to test the advantages and disadvantages of various operations designed to bridge gaps in peripheral nerve injuries.

A plastic operation on the nerve was done in 3 cases. A flap from the proximal or distal end or both ends was used. As no clinical evidence of regeneration was found at the end of three years, there is no physiological justification for such a procedure.

Incomplete nerve-crossing was done in 7 cases. This consists in lateral implantation of the distal segment or of both the proximal and distal segments of the injured nerve into a neighboring intact nerve trunk. In each instance the ulnar nerve had been implanted into the median. No patient showed evidence of ulnar regeneration, while all showed definite interference in conduction in the distribution of the

median nerve. Physiologically and clinically there is no reason to retain such an operation.

The author records 12 cases in which a bridging operation by autogenous or heterogenous nerve-grafts, a fascial sheath, or a vein was performed. His colleague, Platt, has reported 18 others, making a total of 30. In none was there any evidence of motor or sensory recovery at the end of two years.

Displacing a nerve from its course so that the ends may be brought together allows the performance of end-to-end suture in certain cases. Twenty-nine cases in which an ulnar nerve had been displaced to the anterior aspect of the inner humeral condyle were observed. There was no instance of complete failure. In simple end-to-end suture without displacement the proportion of failures has been as high as 30 per cent.

The operation is done in two stages. The first stage consists of drawing together the two ends of the nerve by through-and-through sutures with the limb so fixed that maximum relaxation is maintained. Re-exploration with freshening of the ends and accurate end-to-end suture comprise the second stage. This is not undertaken until sufficient stretching and relaxation have occurred. *A. C. JOHNSON.*

## MISCELLANEOUS

### CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

**Moore, J. T.:** *Blastomycosis; with Report of a Case Dying from Abscess of the Brain.* *Surg., Gynec. & Obst.*, 1920, xxxi, 590.

The organism causing blastomycosis was first described by Gilchrist of the Johns Hopkins Hospital in 1894. At first it was believed that the disease involved only the skin; hence the name "blastomycetic dermatitis." It is now known that it may involve any or all of the organs of the body and may begin either with constitutional or local symptoms.

The source of the condition is still an unsolved problem. The lungs, intestines, skin, tongue, and gums have been thought to be avenues of infection.

The case reported was that of an athletic school boy, 17 years of age, who had no bad habits except that he often held a splinter or stick of some sort in his mouth. His family history also was negative. The condition began with pain in the left lower jaw. A dentist pulled the wisdom tooth but pain and swelling in the face and the side of the head continued. Two months after the condition began, an area above the left ear was drained but only bloody serum was evacuated. As the pain continued the patient consulted a specialist on the ear, nose, and throat three and one-half months after the condition began. The X-ray and other studies showed no mastoid trouble and no involvement of the eye, ear, nose, or throat. The author took charge of the case three months and three weeks after the beginning of

the infection. Examination showed the blastomycosis organisms in several areas over the face.

The treatment consisted of thorough curettage, swabbing with strong iodine, packing for twenty-four hours with iodoform gauze, irrigation with Dakin's solution for four days after the removal of the gauze, and the administration of potassium iodide in increasing dosage up to 240 gr. per day.

One week later another curettage was done and after a few days X-ray treatment was given. In sixty days the wounds had healed except for small superficial areas. The latter were opened up daily and syringed with 1 per cent copper sulphate solution. The patient left the hospital apparently cured. Six months later, however, the tissues in the orbit of the left eye showed evidence of involvement. The abscesses were opened and syringed out with 1 per cent copper sulphate but the eyeball gradually bulged forward. Enucleation was done after the sight had been lost as the result of optic atrophy. A large abscess mass the size of the eye, which was situated deep in the orbit on the temporal side, was evacuated.

Four days later a swelling appeared over the left frontal eminence. From this a large amount of pus was evacuated apparently from beneath the skull. The next day the patient had a convulsion. In all, there were 18 of these attacks. Paralysis of the right arm and partial paralysis of the right side of the face then developed. Death followed.

The Wassermann test was found negative twice and the urine showed nothing abnormal. Blood cultures were also negative. Pus from the face



abscesses showed both large and small blastomycosis organisms; that from the abscess in the orbit, large organisms; and that from the brain abscess, only small organisms.

At autopsy four abscesses with three openings through the skull were found in the left anterior half of the brain. The largest brain abscess measured 3.4 by 2.5 cm.

The author concluded that the infection was probably introduced by the splinters held in the mouth and that the treatment was not sufficiently radical to destroy the various foci of the disease. The eye should have been sacrificed sooner and radium should have been used in the orbit. The X-ray was probably the best agent for the treatment of the lesions of the face and neck. The disease remained more or less local for some time.

### SERA, VACCINES, AND FERMENTS

**Kraus, E., and Sordelli, A.: Experiments upon the Preventive and Curative Power of Normal Serum in Experimental Diphtheritic Infection and Intoxication** (Experimentos sobre el poder preventivo y curativo del suero normal en la infección e intoxicación difterica experimentales). *Rev. Asoc. méd. argent.*, 1920, xxxiii, soc. biol., 365.

Bingel has recently reported a series of 471 cases of diphtheria in which the antitoxin was withheld entirely, injections of normal horse serum being given instead. The mortality in this series was 6 per cent. In a series of 466 cases treated by the usual injections of diphtheria antitoxin the mortality was 5.4 per cent. On the basis of these results Bingel ascribes a curative value to normal horse serum and questions the specific immunizing reaction of diphtheria antitoxin.

Kraus and Sordelli have investigated this subject and have been able to show that normal horse serum may contain diphtheria antitoxin in varying amounts which can be determined by actual titration according to the methods of Ehrlich and Roemer. In colts the quantity is small, while in older horses it is greater.

The preventive and curative power of normal horse and beef sera was then determined by experiments on young rabbits weighing between 600 and 900 gm. It was found that the preventive power depended exclusively upon the content of antitoxin, the quantity of serum having no influence. Thus the smallest preventive dose for a fixed quantity of diphtheria organisms injected into the animals was 0.5 c.cm. of horse serum and 10 c.cm. of beef serum, each of these volumes containing a half unit of antitoxin. However, 10 c.cm. of colt's serum was not preventive, the antitoxin content in this case being only 0.2 of a unit. On comparing the preventive power of the normal sera with that of standard antitoxin, the preventive dose was found to be 0.5 of a unit.

The comparative curative value was tested in much the same way, young rabbits being infected

two hours previously by an intravenous injection of a fatal dose. It was found that normal sera have a curative power in direct proportion to their content of antitoxin. By separating the proteins of the normal sera it was found further that the diphtheria antitoxin was contained in the pseudoglobulins just as in the preparation of diphtheria antitoxin from immune sera.

W. R. MEEKER.

### BLOOD AND LYMPH VESSELS

**Mantelli, C.: The Indications and Results of Saphenofemoral Anastomosis** (Dell' anastomosi safeno-femorale; indicazioni ed esiti). *Clin. chir.*, 1920, n. s. ii, 666.

This article is based on 9 cases operated upon for varix. Mantelli describes the theoretical basis of the Delbet method of saphenofemoral anastomosis in the treatment of varicosis of the internal saphenous vein and discusses the indications, technique, and immediate and end-results.

The indications for saphenofemoral anastomosis are: (1) a good general condition; (2) varicosis of the internal saphenous vein; (3) the Trendelenburg sign; (4) newly formed varicose veins in which the elasticity and contractability of the vessel walls have been preserved at least partially; (5) patency of the saphenous vein and the absence of inflammation.

In the author's 9 cases the following results were obtained: anatomical and functional recoveries, 1; functional but only partial anatomical recoveries, 3; functional recoveries only, 2; doubtful results, 1; and poor results, 2.

The results were poor in one case because there was associated varicosis of the external saphenous vein. This failure is therefore attributable not to the method, but to inexact appreciation of the indications. The second failure was caused by the development of varicosis of deep veins a few months after operation in the case of a patient who had had phlebitis secondary to typhus fever.

On the whole the results were good but the author raises the question whether this operation, which demands delicate execution, is justified on physiopathologic grounds. In his opinion it is the method of choice only in cases of varicosis of the internal saphenous and its branches. In none of Mantelli's cases was it performed more than seven years ago. In other types of cases total saphenectomy is indicated.

W. A. BRENNAN.

**Razzaboni, G.: Primary Sarcoma of the Thrombosed Internal Saphenous Vein** (Sarcoma primitiva della vena safena interna trombizzata). *Arch. ital. di chir.*, 1920, ii, 483.

The author removed a tumor from the inguino-crural region in a man aged 62 years. This growth was the size of an orange and had an irregularly bosselated surface except in the deep portion corresponding to the fascia lata where it was smooth. Its color was a whitish gray with brown spots. On section the growth was found to be traversed with



numerous small blood vessels and covered with a capsule continuous with the sheath of the saphenous vein. Throughout the resected tract this vein was completely transformed into a very hard tortuous cord of uniform rose-gray color. On section the vascular walls could not be distinguished.

The anatomopathologic findings showed that the trunk of the saphenous vein was the point of origin of the tumor. This was demonstrated by the intimate fusion between the neoplastic and vascular tissues and by the capsule of the tumor which showed the structure of the vascular wall. The author concluded that the growth was primary in the thrombosed left internal saphenous vein of the thigh.

Histologically the tumor was sarcomatous and showed traces of melanotic pigmentation. There were no demonstrable metastases in the corresponding lymph glands. While the growth contained a few giant cells, its principal characteristics were those of a polymorphous-celled sarcoma. In limited zones, however, true perivascular cellular masses were demonstrated and clearly differentiated from the rest of the sarcomatous tissue. The fact that these were in intimate relation to the vascular wall on which they seemed to depend suggested that the tumor was of endothelial origin.

In the author's opinion the tumor may have developed in either of two ways: (1) a sarcomatous metaplasia of the connective tissue may have occurred in the thrombosed mass and a perithelial development around some of the blood vessels in the connective tissue mass; or (2) the frankly sarcomatous structure may have become predominant in a perithelioma.

The general symptoms were those common to many lesions of the saphenous vein but Razzaboni believes that if the anatomoclinical findings are carefully studied an exact diagnosis is possible.

W. A. BRENNAN.

**Valentine, H. S.: Traumatic Aneurisms.** *J. Missouri State M. Ass.*, 1920, xvii, 475.

A traumatic aneurism is a false aneurism resulting from a slight injury to a blood vessel. Severe injuries, such as complete division of a blood vessel, seldom result in aneurism. When the injury damages both the artery and its companion vein, an arteriovenous aneurism results. When there is a direct connection between the two vessels an aneurismal varix is formed. When a sac intervenes between the vessels the condition is termed a "varicose aneurism."

The size of the aneurism varies with the time which has elapsed since the injury, its location, and the size of the blood vessel. Of 50 aneurisms, Eccles found that 7 occurred in the head and neck, 14 in the upper limb, and 29 in the lower limb. The popliteal artery was involved in 13 cases, the superficial femoral in 8, and the posterior tibial, the axillary, and the brachial artery in 5 each. The mortality was 8 per cent.

The clinical symptoms of traumatic aneurism are many. The cardinal sign is a pulsating tumor which tends to expand in all directions synchronously with the heart beat and is quieted by pressure over the main vessel. A systolic bruit or a murmur may be heard directly over the aneurism. It is well to remember that at times these murmurs may be transmitted to the heart. A thrill is occasionally felt during systole and Makins has noted a fall in the blood pressure in the affected limb. Pressure symptoms such as oedema, erosions, gangrene, and nerve lesions are to be looked for in the majority of cases. Septic and ascending thrombi are common complications of traumatic aneurism.

Early operation is advisable if there is no infection, if the vessels are still nearly normal, if the X-ray shows absence of foreign bodies in the limb, and if the collateral circulation is sufficient to nourish the extremity. This last condition is best determined by the method of Matas. Complete ischæmia of the limb below the aneurism is obtained by the application of an Esmarch elastic bandage. Pressure on the main vessel is now made to quiet the aneurism completely. The Esmarch bandage is kept in position for five or ten minutes; it is then removed while pressure on the main vessel is still maintained. If the circulation is well established a hyperæmic blush immediately returns.

The classical operation for aneurism has been ligation of the vessels. This has been done in various ways. Grégoire believes that in the treatment of arteriovenous aneurism vessel suture should be attempted more often. Chevrier has reported 6 cases of arteriovenous aneurism successfully treated by extirpation after quadruple ligation. Herrick has proved that fascial inserts can be made without causing clotting of blood in the vessel. He concludes that such an operation can be used to reduce the orifice in sacciform aneurism. Tuffier has successfully treated an aortic aneurism by wrapping strips of fascia lata around the vessel in two layers and producing sufficient tension to narrow the aorta. Macewen has introduced long-pointed tempered-steel pins with which he scrapes the intima, thus producing a blood clot.

The reconstructive operation of Matas for the cure of saccular aneurism is being used more frequently. It is supplanting the old classical operation of ligation. This method is safe, does little damage to the circulation, and gives immediate relief from pressure symptoms. The main vessel is controlled by an Esmarch bandage, a tourniquet, or direct pressure until the aneurism is quieted. The sac is then exposed by a free incision parallel with the long axis of the sac. The sac is opened and explored and the type of aneurism determined. In sacciform aneurism (the common type) a single orifice is found. The purpose here is not only to obliterate the opening between the sac and vessel but also to restore the continuity of the vessel wall. The best type of needle is a small round needle. This should be threaded with vaselined silk. The sac is obliterated.



ated by running sutures, care being taken that the needle does not enter the artery and the size of the vessel is not changed after the sutures are tightened. The circulation of the sac must not be interfered with and no dead spaces should be left. A sterile gauze dressing is applied and the entire limb is wrapped in cotton-batting and immobilized with splints.

LOUIS HANDELMAN.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

Widal, F., Abrami, P., and Iancovescu, N.: *The Test of Digestive Haemoclasia in the Study of Hepatic Insufficiency* (L'épreuve de l'hémoclasie digestive dans l'étude de l'insuffisance hépatique). *Presse méd.*, Par., 1920, xxviii, 893.

The authors give experimental and clinical details regarding a new method of determining functional insufficiency of the liver, viz., the test of digestive hæmoclasia. This test consists in seeking a hæmoclastic crisis after the fasting patient has absorbed a glass of milk. In its simplest form it consists of repeated countings of the leucocytes.

The method described is based on two physiological facts which the authors determined in a series of experiments on dogs: (1) in the normal state during the digestion of an albuminous meal, protein substances which are incompletely disintegrated penetrate the intestinal mucosa and enter the portal vein; (2) the liver opposes the penetration of certain of these substances into the general circulation where, because of their heterogeneity, they unfailingly provoke the appearance of a distinct hæmoclastic crisis.

The authors state that the arresting function of the liver in this connection, which they term the "proteopexic function," has been ignored. The production of the crisis indicates inadequate elaboration of the nitrogenous substances of digestion. It would be produced constantly in the course of digestion if the liver did not protect the organism by arresting the injurious substances.

The proteopexic function is analogous to that which the liver exercises with regard to a great number of toxins coming from the intestine and its importance can be measured by the gravity of the disturbance produced by the direct penetration of non-disintegrated albumins into the general circulation.

The authors' research shows that in the diseased liver the proteopexic power is deficient. The consequent entrance of incompletely disintegrated proteins into the general circulation is immediately translated by a hæmoclastic crisis. In normal subjects the ingestion of nitrogenous food is not followed by a hæmoclastic reaction; instead of leucopenia there is more frequently a hyperleucocytosis, the arterial pressure tends to rise, and the refractive index of the serum is increased. The same is true also in pathologic conditions in which the liver is unchanged.

In making the test the authors have tried numerous albuminous substances but have concluded that milk is the best. Two hundred grams of milk greatly exceed the quantity necessary to provoke hæmoclasia in a case of diseased liver. The patient should fast for at least five hours before the test meal is given. This is most important as the absorption of even a minimum quantity of nitrogenous substance during this time falsifies the results of the test. In the authors' experiments the blood was tested every twenty minutes for three hours after the ingestion of the milk and the leucocyte content, arterial pressure, coagulability, and serum refraction index of the blood were noted to discover the occurrence of a hæmoclastic crisis. The results are obtained within one hour and the crisis is in its apogee at about the end of the first forty minutes. The clearest finding is leucopenia.

The test meal produces immunity for about three hours and the ingestion of a second meal during this time will usually not give positive results.

The authors have determined the value of the test clinically in cases of manifest hepatic lesions, such as those causing icterus, cancer of the liver, cirrhosis, etc. They have used it altogether in 39 cases. In all of these, except 1, the results have been remarkably clear. The blood cells decreased progressively to three-fourths, one-half, and even one-third of their original number, the arterial pressure decreased 1 to 2 cm. or even more, the blood became more rapidly coagulable, and the serum refraction index fell. After about an hour and a half these figures were reversed, a phase of leucocytosis with slight hypertension succeeding the hæmoclastic crisis. Early appearance, rapid evolution, and especially marked diminution in the leucocytosis and the arterial pressure were the characteristics of the hæmoclastic crisis in the cases of liver affections subjected to the test. The case which was an exception to the general rule was a case of pigmentary cirrhosis in a malarial diabetic. In this type of cirrhosis a sufficient number of normal hepatic cells survive to maintain the proteopexic function of the organ.

The clear results obtained by the test of digestive hæmoclasia in evident cases of liver disease have prompted the authors to make the same research in cases in which hepatic pathology is suggested by only very slight urological symptoms and those in which it is merely suspected, the symptoms being entirely absent. They give the details of this study in a number of such cases, including alcoholism, diabetes, etc. They have been convinced of the extreme sensitiveness of the test as it clinically revealed latent hepatic lesions which would otherwise have passed unperceived.

Particular attention is given to the study of the effects of arsenobenzol injections and anæsthetics. Chloroform administered in weak dosage and during a very short time very rapidly injures the proteopexic function of the liver, the effect appearing usually the day following the induction of the anæsthesia. The effects of ether are not so constant.



In cases of appendicitis the results of the test established the presence of latent disease of the liver due to a focus in the appendix. The menace to the liver usually disappears within a few weeks after the removal of the appendix. Diabetics showed the hæmoclastic crisis after the ingestion of a small quantity of sugar.

W. A. BRENNAN.

**Bazán, F.: Accidents from Lumbar Puncture in Hydrocephalus Due to Tuberculoma of the Cerebellum** (Accidentes por punción lumbar en la hidrocefalia tuberculoma del cerebelo). *Semana méd.*, 1920, xxvii, 797.

Bazán reports two cases of hydrocephalus in infants in which death resulted from lumbar puncture. The first was a case of congenital hydrocephalus in an infant 8 months of age. Lumbar puncture with the removal of 5 c.cm. of fluid produced no untoward effects. A second puncture two months later with the withdrawal of 40 c.cm. of fluid was followed by symptoms thought to be due to cerebral congestion. These consisted of fever of 100 to 101 degrees, paralysis of one arm, generalized rigidity, a Kernig sign, and trismus. Gradually coma supervened, growing continuously deeper until death occurred five days after the puncture. No autopsy was performed so that the underlying pathology remained unknown.

Death followed the second lumbar puncture also in the other case. The patient was 17 months of age and the hydrocephalus was very pronounced. Death resulted twenty-four hours after ventricular puncture with the removal of 10 c.cm. of fluid. A somnolent state with a mild temperature developed at once and was followed by coma. At autopsy marked caseous degeneration of the mesenteric lymph glands and a tuberculoma of the cerebellum occupying the central portion and almost half of both lateral lobes were found.

The cause of death from puncture in hydrocephalus has been variously explained as due to too sudden decompression, hæmorrhage ex-vacuo, and intercurrent infection. The probable presence of a brain tumor is not regarded as a contra-indication to lumbar puncture, but in such cases the needle used should be very fine, only a small quantity of fluid should be withdrawn, and an equal amount of serum should be injected.

W. R. MEEKER.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Camus, J., and Roussy, G.: Experimental Research on the Pituitary Body.** *Endocrinology*, 1920, iv, 507.

The authors consider in succession the relation of polyuria to the removal of the pituitary body, the relation of polyuria to lesions of the base of the brain, the site of the lesions which lead to polyuria, the interrelation of polyuria and polydipsia, and the regulation of water retention in the body.

In a very great number of cases hypophysectomy, partial or total, practised on the dog by the buccal-transpalato-sphenoidal route marked polyuria was noted. In the cases of the first 2 animals operated upon the urine was not measured accurately as receptacles of a capacity of only 1 or 2 liters were placed under the cages and during the night these overflowed.

At first, in the belief that the pituitary body alone was involved, the authors measured the relative importance of the different parts of the organ in the production of the phenomenon. They were very rapidly brought to the realization, however, that the key to the phenomenon was not to be found in an attenuation of the hypophyseal function. Contrary to the generally accepted view, these ablations—whether total or limited to one lobe—did not influence diuresis. Two examples, chosen from among others, are given to bring out this point. In 2 dogs complete removal of the hypophysis resulted in a notable polyuria in 1 while in the other there was not a trace of polyuria. The autopsies showed that in the first case the base of the brain had been somewhat injured during the hypophysectomy, while in the second the brain was intact.

To determine the rôle played by lesions in the part of the base of the brain which borders on the pituitary body, the authors injured this region with a heated needle without injuring the hypophysis itself. To do this they perforated the sphenoid with a gimlet. In the five cases in which this operation was performed a very marked polyuria resulted despite the absence of any change in the pituitary body as shown at autopsy.

During certain experimental investigations on the pituitary body the authors observed trophic troubles of the genital organs. From their experience gained from 5 dogs they concluded that in the incidence of atrophy of the genital organs they were dealing rather less with a hypophyseal lesion than with trouble at some point in the base of the brain, the exact site of which could not be determined without more precise methods.

Their experimental research on hypophyseal glycosuria was of two types, that dealing with a spontaneous glycosuria consecutive to an operation on the pituitary body, and that dealing with the tolerance for carbohydrates of the animals operated upon. Forty-five dogs and 9 cats were used in these investigations. In the 45 dogs glycosuria was observed only 6 times. That is, in 39 cases the result was negative so far as the presence of sugar in the urine was concerned. In 30 of the animals lesions of the base of the brain were not produced. In 14 the removal was complete while in the 15 others it was partial. In all these cases no glycosuria was observed after operation. Of the 6 dogs showing positive results at least 4 showed lesions of the base of the brain.

To determine the tolerance to carbohydrates on the part of animals deprived of the pituitary body—alimentary glycosuria—glucose was given through



an oesophageal tube to dogs which had been totally or partially deprived of the pituitary body. The different interventions practiced on the pituitary body—partial removal of one or both lobes or total removal—modified in appreciable fashion neither the tolerance to carbohydrates nor the appearance of alimentary glycosuria.

Injections of concentrated extracts of the posterior lobe, the anterior lobe, or the whole hypophysis did not sensibly modify the limit of tolerance to carbohydrates in the animals operated on.

G. E. BEILBY.

**Crile, G. W.: The Relation of the Thyroid and of the Adrenals to the Electrical Conductivity of Other Tissues.** *Endocrinology*, 1920, iv, 523.

Crile mentions Osterhaut's demonstration that iodine increases the electrical conductivity of living vegetable tissue. In an investigation undertaken in his laboratory he found that the electrical conductivity of the brain, the liver, the spinal fluid, the heart, and the lungs is increased in iodism produced by the injection of iodoform into the peritoneal cavity. A limited number of observations indicated that an increase in the conductivity of the brain and liver is an early effect of thyroid feeding. In exhaustion produced by thyroid feeding for prolonged periods the conductivity of the brain is decreased as in exhaustion due to other causes.

The relation of the increased electrical conductivity produced by iodine to the function of the thyroid gland became apparent with the realization that, as far as was known, the only function of the thyroid gland is to metabolize, to store, and to deliver iodine, and that the excessive administration of iodine produces symptoms identical with those produced by abnormal amounts of thyroiodine manufactured by the thyroid gland. A limited number of observations indicated that excessive iodine and excessive thyroid activity alike produce increased sensitivity to adrenalin, increased metabolism, increased respiration, tachycardia, elevation of the temperature, and ultimately emaciation, delirium, and death.

As the normal activities of life in the case of the normal individual are made possible by the amounts of iodine received from the thyroid, and as abnormal amounts of iodine increase the activity of the organism as a whole, this increase was interpreted in the light of the author's experiments as due, in part if not wholly, to the effect of iodine upon the electrical conductivity. Persons with exophthalmic goiter tolerate iodine poorly. If too much iodine or thyroid extract is given to a patient with simple goiter, exophthalmic goiter is induced. Such cases are identical with exophthalmic goiter induced by any other cause. On the other hand, if the thyroid gland does not metabolize sufficient iodine to meet the need of the organism there results a condition of subnormal metabolism in which the individual is dull, stupid, and more or less in a state of torpor.

Iodine increases the electrical conductivity of living tissue; increased electrical conductivity is probably synonymous with increased permeability; increased permeability increases function.

Through the mediation of the nervous system a reciprocal interaction is established between the thyroid, the adrenals, and the nervous system. Iodine alone, adrenalin alone, thyroid extract alone, emotion, exertion, or infection alone each causes a "kinetic drive" with phenomena similar to those of exophthalmic goiter.

If this interpretation is correct, the drive of exophthalmic goiter is diminished by lessening the activity of any of the three interacting organs—of the brain, by rest cure; of the thyroid, by resection; of the adrenals, by partial removal. Although evidence of the positive value of the last-named procedure is incomplete, nothing in surgery has been more striking than the immediate benefit derived from the surgical treatment of exophthalmic goiter.

G. E. BEILBY.

**Asami, G., and Dock, W.: Experimental Studies on Heteroplastic Bone Formation.** *J. Exper. M.*, 1920, xxxii, 745.

The occurrence of bone in abnormal locations has been frequently reported in the literature and its experimental production in various species of animals has been recorded by a number of workers. Recently a case of bone formation in the fallopian tube was described and the possible mode of its origin was discussed on the basis of a review of the literature and clinical and histological study. Most of the experimental work done has dealt with such problems as the origin of the blood cells and the restoration of renal function, and for this reason reliable and convincing data on the mode of origin and growth of aberrant bone were not then available. Although almost all investigators agreed that such bone arose from fixed tissue cells by a process of metaplasia, there was much difference of opinion as to the factors initiating the process and as to whether the proliferating cells became osteoblasts or merely a hyaline connective tissue which later was directly converted into osseous tissue.

Numerous observations of human pathologic specimens and animal experiments have been published, but the opinions based upon them are conflicting. Because of the accidental nature of the experimental investigations thus far carried out, detailed descriptions of the processes involved in the aberrant bone formation have not been available. The authors therefore decided to carry out further investigations as regards the mode of origin, growth, and detailed structures of the bone as well as the probable part played by cartilage and calcium salts in initiating this bone formation.

Thirty-nine rabbits were divided into three series. In the first series of 20 animals the renal vessels were ligated on one side. In all but 1 animal the left side was chosen. In 2 of the animals the ureter was included in the ligation and resection. In the second



series of 14 rabbits portions of the ear and xiphoid cartilages were resected and transplanted into the subcutaneous tissue of the same animal. In a few instances these cartilages were boiled in water before transplantation. The 5 animals comprising the third series were subjected to subcutaneous and intramuscular injections of calcium salts, consisting of calcium chloride and calcium carbonate, and of sodium phosphate.

The animals were killed at various intervals in order that the changes brought about by the experiments might be followed progressively. The tissues were fixed in 4 per cent formaldehyde solution, decalcified in a mixture of phloroglucin and nitric acid, embedded in celloidin, and stained in hæmatoxylin and eosin. In some instances the Weigert-Van Gieson method of staining was used to differentiate the tissues. Many of the kidneys were sectioned *in toto* in order that different areas might be studied.

Before reviewing the new points brought out by their experiments the authors discuss the extent to which they were able to corroborate the observations and views of previous investigators. Unlike Liek, who used a method similar to theirs in studying the rabbit kidney, they did not find evidence of bone formation as early as sixteen or twenty days after ligation of the renal vessels. This failure was probably due to differences in the rate at which vascularity was restored. Neither did they observe in the early stages of bone formation in the kidney the close juxtaposition of the bone and the calcium deposits noted by Lick. On the contrary, in the earliest stage the bone was located under the epithelium of the pelvis farthest from the calcified tubules. Prior to the time when the epithelium of the calices had grown out to the lime plaques no bone was found in the cortex of any of the kidneys.

As to the manner in which connective tissue is transformed into bone, two distinct processes have been hitherto described by numerous writers. According to these views, either a hyaline connective tissue or scar tissue may be converted directly into bone or calcified materials are eroded with the formation of vascular areas containing young connective-tissue cells some of which take on the function of osteoblasts. The histologic pictures presented by the authors' specimens probably represented three different types of transformation. The first and most frequent was the accumulation of young fibroblasts in the area under the transitional epithelium to form a sort of membrane which deposited bone cells. The bone increased in size by progressive ossification with inclusion of cells of the periosteum-like membrane. Second in frequency was the type described by Liek, Rosenstein, Pearce, and others, in which there was direct transformation of hyaline connective tissue into bone. This process took place only in the presence of pre-existing bone and therefore was not considered a primary process. The third type, in which cells of the vascular granulating tissue which eroded calcium deposits became

converted into osteoblasts, was observed only in 1 of the 13 specimens showing bone formation.

The theory that heteroplastic bone was formed as a result of the stimulation of young fibroblasts by lime salts was based mainly upon the recorded fact that the bone formation took place in the immediate vicinity of the calcium deposits, since Liek and many others were unable to confirm the statement made by Barth that the injection of calcium salts or the implantation of dead bone would stimulate bone formation. In the authors' series of cases in which calcium injections were given no evidence of bone formation was observed as late as fifty days after the injection. In pathologic calcification followed by ossification other factors than the mere presence of calcium salts were perhaps involved and these as yet undetermined factors might be essential to heteroplastic bone formation. It seemed evident that in a richly vascular tissue cells a few millimeters away from the relatively insoluble salts were bathed by a tissue fluid of practically the same composition as that found in any other part of the body. Close proximity between the bone and lime salts was not found in the series. However, it was impossible to exclude the possibility that the young connective-tissue cells received a stimulus from the calcium salts at the time they first migrated into the necrotic areas poor in blood supply and that bone was formed when vascularity was restored and the area had become again comparatively free from calcium.

In the cases of ossification in the cartilage in which endochondral bone formation was observed evidence pointed toward the stimulation of fibroblasts by almost direct contact with the calcified matrix of the cartilage. When a connection between cartilage and bone could not be established and the process of ossification resembled that in the kidney described as the first type, stimulation by calcium might have played a part since, as Wells and Benson have shown, even the cartilages that did not ossify had some affinity for calcium and absorbed the salts from the tissue fluids. It was not improbable that under favorable conditions fibroblasts coming in contact with such cartilage might be caused to differentiate into osteoblasts.

The authors conclude that bone formation in the rabbit kidney with ligated vessels took place: (1) through the activity of young fibroblasts which accumulated to form a membrane-like structure; (2) subsequently by direct ossification of hyaline connective tissue in continuity with preformed bone; and (3) through erosion of lime plaques by granulating tissue and the laying down of lamellar bone by cells derived from fibroblasts.

Bone formation in the rabbit kidney began not in direct contact with calcium deposits, but in the loose vascular connective tissue close under the transitional epithelium of the calices.

In cases of autotransplantation of ear cartilage in the rabbit there was an active new formation of cartilage in the connective tissue which surrounded



the transplants and the bone was formed by the fibroblasts from the perichondrium which eroded and invaded the calcified areas in the new cartilage.

The process of bone formation in the kidney was similar to that found in normal membranous ossification, while in the transplanted ear cartilage the process was identical with endochondral ossification.

G. E. BEILBY.

**Stillman, E. G., and Bourn, J. M.: Biological Study of the Hæmophilic Bacilli. *J. Exper. M.*, 1920, xxxii, 665.**

The authors report the data obtained during an investigation of the hæmophilic bacilli recovered from the throats and sputum of patients suffering from acute influenza and lobar pneumonia and healthy persons. The study includes the determination of: (1) the final hydrogen-ion concentration, (2) sugar fermentation, (3) indole production, (4) nitrate reduction, and (5) gas production. In addition to the strictly hæmophilic organisms, bacillus influenzae and the so-called "bacillus X" described by Pritchett and Stillman, a few strains of bacillus pertussis, the bacillus of rabbit septicaemia, and bacillus bronchisepticus were included for comparative study.

As the hæmophilic bacilli were delicate organisms which did not grow readily on artificial media, special attention was paid to the minute details of the technique. Before the use of special media such as oleate sugar and chocolate agar the bacillus influenzae was cultivated with difficulty and this fact probably accounts in large part for our lack of knowledge regarding its biology. A freshly prepared medium adjusted to the optimum hydrogen-ion concentration, pH 7.3 to 7.5, was essential for growth.

Upon isolation the majority of the strains of bacillus influenzae and all the strains of bacillus X were plated on dextrose agar to which no hæmoglobin had been added. In no instance was growth obtained in the hæmoglobin-free medium. After prolonged artificial cultivation, which in some instances was continued over two years, all these strains were again plated on ascitic dextrose agar without hæmoglobin. Invariably, however, they failed to grow on such media. All media used in this study were enriched by the addition of 4 per cent defibrinated rabbit blood or 2 per cent blood extract. In the case of the hæmolytic bacillus X the latter was substituted for defibrinated rabbit blood as the hæmolysis produced by this organism masks certain reactions. In many instances also in the work with the non-hæmolytic hæmophilic bacilli (bacillus influenzae) blood extract was used to enrich the media when defibrinated blood might have interfered with the determination of a reaction. The extract was made according to Wollstein's method.

The small Gram-negative hæmophilic bacilli which gradually came to be considered as belonging to one group of organisms and to which the name "bacillus

influenzae" was given appeared to be rather a group of closely allied bacilli which had demonstrable biological differences. The bacillus which Pfeiffer first described and associated with clinical influenza was not questioned as being the etiological factor in the spread of this disease. However, the percentage of cases in which the bacillus of Pfeiffer was recovered was great enough to indicate that the organism was at least a secondary invader. Since the first description of this hæmophilic bacillus in 1892 by Pfeiffer little has been added to our knowledge regarding its biological characteristics.

In this study the authors found that the hæmophilic bacilli observed divided themselves naturally into two large groups according to their ability to hæmolyze whole blood. The hæmolytic group comprised the organisms originally described as bacillus X by Pritchett and Stillman and were found in normal mouths. Because of the almost universal use of chocolate medium many of these hæmolytic bacilli were no doubt confused with the non-hæmolytic variety. On oleate agar the colonies were so similar that they could not be distinguished, and morphological differences were so slight that they could not be regarded as reliable. Organisms of the hæmolytic type (bacillus X) did not live so long in culture media as those of the non-hæmolytic type. They were best preserved at a low temperature. A few strains were found to live from two to three weeks if kept in blood broth in the ice chest, but to preserve them successfully in stock cultures it was necessary to transplant them every six or seven days. At room temperature bacillus X survived about five days, while at 37.5 degrees C, it remained viable about ten days. The non-hæmolytic group (bacillus influenzae), on the other hand, remained viable in blood broth for a month or more at room temperature.

A tentative classification, graphically illustrated in this article, defines a small subgroup of the hæmolytic group formed by the strains which produce indole and gas but do not ferment saccharose. These strains appeared to ferment sugars less readily and further study was necessary to determine whether the indole-producing strains were also gas producers. The greater number of hæmolytic strains, however, did not produce indole or gas, but fermented saccharose.

Although the number of strains of bacillus influenzae employed was too small to warrant any definite conclusions, it appeared that the non-hæmolytic bacilli isolated from persons suffering with, or recovering from, respiratory infections and those isolated from normal mouths during the epidemic period differed biologically in certain respects from the strains recovered from normal persons during the winter of 1919-20.

The Gram-negative bacilli which were not hæmophilic and which were studied because of their morphological similarity were easily differentiated from the hæmolytic and non-hæmolytic hæmophilic bacilli of the influenza type.



Both the hæmolytic and the non-hæmolytic groups of bacilli are further subdivided by the authors according to their ability to produce indole, to form gas, and to ferment certain carbohydrates. The hæmophilic bacilli of both the hæmolytic and the non-hæmolytic varieties reached a final hydrogen-ion concentration of about pH 6.4 when grown in meat infusion broth containing 1 per cent of dextrose. In addition, practically all the strains possessed the power to reduce nitrates to nitrites.

G. E. BEILBY.

**Meador, P. D., and Robinson, G. H.: Biological and Physical Properties of the Hæmotoxin of Streptococci.** *J. Exper. M.*, 1920, xxxii, 639.

The isolation of hæmolytic streptococci from many different pathologic lesions demonstrates their importance as pathogenic organisms. Various investigators have pointed out two types of these organisms, one of which produces hæmolysis only on blood agar, while the other produces also a hæmolytic substance, or hæmotoxin, in bouillon. Whether or not all laking of erythrocytes as exhibited on blood-agar plates by different strains is the result of the same reaction has not been made clear. However, the ability to produce hæmotoxin in bouillon seemed to be a definite characteristic of certain strains of streptococci. Hæmolytic power being a biological function of most virulent streptococci, the authors were interested to determine the nature of the hæmotoxin.

Frequent attempts have been made to separate hæmotoxin from the organisms by filtration. Filtration was of the first importance in showing whether the hæmotoxin was in solution form or contained within the bacterial cells. Aronson (1902) stated that hæmotoxin would pass through a filter. Besredka (1901), using a Chamberland filter, noted a relation between the rate of filtration and the hæmolytic strength of the filtrate and suggested that perhaps the active substance was retained in the pores of the filter. Ruediger (1903) stated that the filter should be carefully selected as if it is too fine it will remove the hæmolytic property. Von Hellens (1913) and Nakayama (1919) were able to obtain hæmolytic filtrates only with considerable loss of potency during the procedure. Maasen filters were used in their experiments. M'Leod (1911-12) and Braun (1912) were able to secure hæmolytic filtrates by the use of Maasen filters. Lyall (1914) was not able to obtain hæmolytic filtrates by the use of coarse Berkefeld filters.

Owing to the contradictory results reported in the literature the repetition of much of the work on this subject seemed necessary. The object of the investigation reported in this paper was to determine if possible the nature of the hæmotoxin by studying its filterability, the effect of absorptive agents, the effect of centrifugalization and shaking, and the basic substances from which it is produced.

The results of these experiments indicated that as long as the phospho-proteins were present in the

medium the maximum amount of hæmotoxin was produced and that the addition of phosphorus compounds restored, in part but not completely, the hæmotoxin-producing properties of the medium. The non-production of hæmotoxin in phosphorus-free bouillon was not due to the lack of buffer action as the reaction was unchanged by the growth of the streptococci and presented a range within which hæmotoxin had been produced repeatedly.

The authors concluded that the hæmotoxin of streptococci is a labile substance affected by centrifugalization or shaking and adsorbed by various organic and inorganic substances. Hæmotoxin was produced within a wide range of hydrogen-ion concentrations. It was neither in nor on the bacterial cell but free in the culture medium. It is probably not an enzyme. There were at least two substances which were essential to the medium for the elaboration of hæmotoxin. One of these is phosphorus, the other, a substance of unknown composition. The unknown component was present in small quantities in unfiltered muscle infusion, but was more abundantly supplied by blood serum and kidney infusion. This substance was not an albumin, globulin, primary or secondary proteose, meta-protein, or peptone of the medium or enriching fluid. It was water-soluble, was destroyed by boiling in alkaline solution and prolonged heating, and was removed to a considerable extent by passage through a diatomaceous filter.

G. E. BEILBY.

**Kahn, A.: The Logical Cause, Pathology, and Treatment of Brain Lesions; an Experimental Paper.** *Laryngoscope*, 1920, xxx, 809.

In order to ascertain the logical cause, pathology, and treatment of brain lesions of otological origin, Kahn conducted a series of animal experiments.

From these investigations he learned, first, that absorption from the subdural space is quicker than absorption in the peritoneal cavity; that in operations upon the brain the element of shock is very much greater than in operations in the peritoneal cavity; and that reaction upon the part of the system to infections within the brain is slower in comparison to its reaction to infections in the peritoneum, but absorption is quicker.

Kahn's primary object in performing these experiments was to learn if he could infect a dog, allow him to go to a point at which death from infection seemed imminent, and then bring into play some force which would keep the dog from dying. He first opened the peritoneal cavity and introduced dust from the laboratory floor. In these experiments the dog recovered practically invariably without any interference on the author's part. In another experiment Kahn injected streptococci and staphylococci into the peritoneal cavity and blood stream of dogs. The results were the same. He then placed in the peritoneal cavity small pledgets of gauze saturated with pus taken from dogs which had died just previously from a purulent infection, and also pure pus without gauze. When pus alone was



used, the dogs became immediately very ill and many of them died within twenty-four hours but the postmortem examination often showed no reaction whatever. In other instances when pure pus was used there was evidently an endeavor on the part of the system to react and throw up a defense for the peritoneal cavity was inflamed and purulent. When gauze containing dust from the laboratory was used, the systemic reaction was very slow, the dog recovered, and on postmortem examination the gauze was found to be walled off. When gauze saturated with pus was used, the reaction was more intense and quicker than when gauze with dust was used. The dogs became very ill but some of them recovered. At the postmortem examination the gauze was found to be either entirely or nearly entirely walled off.

The practical conclusions drawn from these experiments are:

1. It is not the infectious organisms alone or dirty material containing these bacteria of a non-animal character that is dangerous, but the absorption of the débris resulting from the strife of the tissues on the one hand and the invasion of the infecting organisms on the other which is responsible for the toxæmia and fatal outcome in these cases of peritonitis, meningitis, etc.

2. Clinically, the more important process is the systemic toxæmia. This is what causes death.

3. Any serum treatment to be devised in the future will owe its success or failure to its ability or lack of ability to overcome the débris resulting from the infectio-inflammatory combat, and will not be based upon the activity of bacterial life in the laboratory. In other words, it will be probably an autogenous serum.

In the experiments reported Kahn also injected directly into the blood vessels of some of the animals weak solutions of citrate of soda and blood which were not sterilized. The animals were not in the least affected.

The present methods of treating brain lesions are practically all surgical. Kahn believes that successful treatment in the future will develop along lines tending to immunize the system to the invading organisms until the cells are able to localize the infection. Two methods suggest themselves to him. First, he believes it may be possible to make a serum. The second method consists of the transfusion of blood from one person to another and back again over a period of time or at frequent intervals. Kahn has never tried this method on human beings, but his success in animal experiments leads him to believe that it would be perfectly safe when applied to the human subject. The technique used in the animal experiments is described briefly as follows:

The peritoneal cavity of the dog was infected in the various ways described. It was found that within twenty-four to forty-eight hours a dog reached the height of his infection and that if he were not given a transfusion death resulted. Therefore a transfusion from a healthy dog was given within from

twenty-four to forty-eight hours after the infection. The dogs treated in this way almost invariably recovered. In several instances the transfusion was continued for a period of from thirty minutes to two hours so that there was a continuous circulation of blood between the two animals.

In a transfusion given in this manner the toxic blood passes over to another animal and the toxin in the infected animal is ultimately reduced just one-half. It must be remembered that the blood passed from the diseased animal to the normal animal contains substances which will cause the organs of the normal animal to react and form an additional amount of immunizing substances so that the force of resistance will be increased. If after a lapse of from twenty-four to forty-eight hours the diseased animal is given another transfusion from the same normal animal, his blood will be still further re-inforced by antitoxins. This may be repeated until the local point of infection is walled off and the diseased animal is able to take care of himself.

Kahn considers the method of continuous transfusion much superior to the injection of saline solution or the usual transfusion of blood.

G. W. HOCHREIN.

#### ROENTGENOLOGY AND RADIUM THERAPY

MacCarty, W. C.: *Chronic Gastric Ulcer and Gastric Carcinoma*. *Am. J. Roentgenol.*, 1920, vii, 591.

The author considers in this paper: (1) the pathology of simple chronic gastric ulcer and gastric carcinoma, (2) the co-existence of the two conditions, (3) the question of carcinomatous change occurring in simple ulcer, and (4) the practical application of the findings. The observations are based on a study of 507 chronic simple ulcers and 895 carcinomatous ulcers operated on at the Mayo Clinic.

Gastric ulcers may be single, multiple, acute, chronic, or carcinomatous, and may occur in any portion of the stomach. They may be large or small, shallow or deep. Chronic gastric ulcers larger than 2 cm. in diameter are usually, but not always, carcinomatous. The converse of this, however, is not true, because many ulcers less than 2 cm. in diameter are carcinomatous. When associated with ulcer, the carcinoma always involves the mucosa, and usually one or more of the other coats.

In simple chronic ulcer with no evidence of carcinomatous change the mucosa at the margin of the ulcer contains tubules which are essentially normal. The living epithelial cells are columnar, and their long axes correspond to the radii of a circle. The nuclei are ovoidal and uniform in size, being about one-third the volume of the entire cell. The tubules themselves may be distorted, and there is usually a lymphocytic infiltration of one or more of the stomach coats. The base of the ulcer is necrotic and the general course of the scar tissue is perpendicular to the surface of the crater.



Another type of chronic ulcer, grossly indistinguishable from that just described, has as its sole visible difference a change in the type of cell which lines the tubules in the marginal mucosa. Instead of the orderly columnar cells, ovoidal or spheroidal cells line the tubules. The nuclei of these cells have increased to about one-half the total cell volume. Another conspicuous difference is the presence of one or more definite and distinct nucleoli in the cells. Loss of uniform cell relationship is another distinguishing feature, that is, the long axis of the cell may run in any direction although the position of the cells is morphologically intratubular; they are indistinguishable from cells that are known definitely to be carcinomatous.

The third type of chronic ulcer shows the same gross and microscopic picture as the type just described with but a single difference. The ovoidal nucleated cells are no longer confined to the lumen of the tubules, but may be found free within the stroma. Sometimes they are only in the mucosa, but whenever they are at the base of an ulcer or in coats other than the mucosa, they are found also in the mucosa. When they occur only in the mucosa, the gross appearance of the ulcer is not always altered. Sometimes they appear in all coats with no alteration in the gross appearance.

On the basis of these data MacCarty approaches three commonly raised questions: Does carcinoma develop on chronic gastric ulcer? How frequently does this change occur? Does the change develop in the base or at the margin of the ulcer? A scientific answer cannot be made to any one of these questions because there are no positive or negative facts regarding the development of carcinoma which can be demonstrated in the study of simple and carcinomatous ulcers. Furthermore, a carcinoma has not been produced on an experimental gastric ulcer. Valuable practical deductions may be drawn from the foregoing facts as follows:

1. Every patient with a chronic gastric ulcer may be harboring a carcinomatous ulcer. The differentiation may be possible only to a trained surgical cytopathologist.
2. The roentgenologist, surgeon, or pathologist who knows that an ulcer is more than 2 cm. in diameter can guess with a fair degree of accuracy that the ulcer is carcinomatous.
3. The ideal treatment of a chronic gastric ulcer is resection or excision. Subsequently the specimen should be submitted to a competent cytopathologist.

H. W. BACHMAN.

**Pendergrass, E. P., and Pancoast, H. K.: A Case of Pedunculated Adenocarcinoma of the Stomach and Possible Errors in Diagnosis. *Am. J. Roentgenol.*, 1920, vii, 602.**

The case of pedunculated adenocarcinoma of the stomach reported is of interest because of the similarity of the roentgen findings to those of two other cases, also reported, which subsequently proved negative. In the former a number of per-

sistent filling defects were visualized which were interpreted as due probably to papilloma or carcinoma, or possibly to sarcoma. Operation revealed a small pedicled mass which frozen section demonstrated to be an adenocarcinoma. The two negative cases also showed small filling defects at first but re-examination after an interval failed to reveal them.

In order to discover what would cause filling defects like those observed the authors gave a patient some grapes with his breakfast and then examined his stomach with the X-ray six hours later. No filling defect was found. A second patient was requested to swallow the pulp of an orange but in this case also the examination six hours later was negative. A third patient was given grapes and requested to swallow some of them whole. An examination made immediately thereafter revealed large filling defects. Apparent filling defects, therefore, cannot always be taken as positive evidence of an organic lesion and a second examination should be made after an interval of several weeks in order that the first diagnosis may be confirmed or disproved.

ADOLPH HARTUNG.

**Strathy, G. S.: A Further Study of Liver Atrophy by X-Ray Examination. *Canadian M. Ass. J.*, 1920, x, 1073.**

It is the purpose of this paper to describe Strathy's method of measuring the liver and to discuss the difference between the roentgen-ray shadows of normal and atrophic livers more fully than was done by the author in a previous article. Attention was first drawn to the possibility of detecting atrophy of the liver accurately in a roentgen examination by the acute angle formed by the juncture of the shadows of the upper surface of the liver and the vertebræ in cases of salvarsan poisoning.

Measurements of a large number of normal livers were made and, allowing for differences in build, the size and shape were found to be almost constant. The method of measuring was as follows:

With the patient standing behind the fluorescent screen, the level of the upper surface of the liver was marked on the skin in the right parasternal and nipple lines at the end of normal expiration. To prevent error this was repeated at least once. The level of the lower surface of the liver in the same lines, at the end of expiration, was then marked on the skin and the horizontal distance between these two markings measured and recorded. It was found that the depth of the liver shadow was greater in the standing position than in the recumbent position. The liver apparently rotates somewhat on a horizontal axis when the position of the body is changed. The depth of the liver varied from  $5\frac{1}{2}$  to  $6\frac{1}{2}$  in. in the right parasternal line and from  $6\frac{1}{2}$  to  $7\frac{1}{2}$  in. in the right nipple line. The normal outline of the liver shadow was as follows:

The upper border followed closely the shadow of the inner surfaces of the lower ribs on the right side and curved upward and inward with the shadow of



the diaphragm, meeting the shadow of the vertebræ and sternum usually at a right angle but sometimes at an obtuse angle. It then extended from the left side of the shadow of the vertebræ and sternum where it merged with the heart shadow and met the stomach bubble about 3 in. from the midline. When the patient was standing the lower border extended from 1 to 2 in. below the costal margin on the right side and crossed the midline, forming an angle of approximately 70 degrees with the vertical to meet the stomach bubble just below the heart.

Variations from the normal appearance may be due to displacement of the liver or a change in its size. Only a few cases of liver hypertrophy were seen. In these there was little change in the contour of the upper border of the liver shadow. In cases of atrophy there was a decrease in the vertical or the transverse measurement of the liver shadow or in both. A decrease in the transverse diameter of the liver was more commonly found than a decrease in its depth. This was usually shown by the shifting of the left border of the liver to the right rather than by the displacement of the right border to the left. The latter condition, however, was noted occasionally. When the right border of the liver remained close to the ribs and the left border was contracted to the right, this was shown by the fact that the hepaticovertebral angle became acute and the upper surface of the liver more dome-shaped. The stomach bubble was then seen farther to the right than normal and in some cases reached the left border of the vertebral shadow.

With the shrinking of the liver on the left the heart was frequently displaced to the right. With this shrinking of the transverse diameter the depth of the liver shadow may not be decreased and may be actually increased. In other cases the lower border of the liver assumed a more nearly perpendicular position than normal. The acute hepaticovertebral angle is the most striking sign of liver atrophy but it was found also to a slight extent when the left lobe of the liver was displaced downward by fluid in the left pleura, as in pleurisy with effusion or hæmothorax, and when a very large heart pressed on the liver through the diaphragm. It was found in one of over a hundred normal persons examined. In the lighter cases of atrophy there may be no decrease in the depth of the liver shadow, but in the more marked cases it is always present.

In conclusion the author suggests that atrophy of the liver is more common than is generally believed. He has found it in catarrhal jaundice as well as in jaundice due to arsenical poisoning. It is recognized that many cases of chronic dyspepsia are slight cases of atrophic cirrhosis and this may be diagnosed by roentgen-ray examination only when the liver shadow is carefully studied. ADOLPH HARTUNG.

**Henderson, M. S.: Osteocartilaginous Joint Bodies.**  
*Am. J. Roentgenol.*, 1920, vii, 588.

The author has observed loose osteocartilaginous joint bodies in the elbow, the shoulder, and the knee.

In the knee, the joint most frequently affected, these bodies seem to be due to several conditions, including osteochondritis dissecans, hypertrophic arthritis, and osteochondromatosis.

Osteochondritis dissecans, which usually develops before the fortieth year of age, is thought to be caused by the blocking of the end artery supplying an area of the internal condyle just back of the insertion of the posterior crucial ligament. This condition may be bilateral. The X-ray rarely shows more than two or three bodies. It reveals also a depression on the internal condyle. In hypertrophic arthritis fragments of the osteophytic growths may become detached in the knee and, nourished by the synovial fluid, increase in size. The X-ray may show several of these bodies, large and irregularly shaped, with marked arthritic changes. Persons with this type of growth are usually over 40 years of age. In osteochondromatosis large numbers of bodies are formed from the thickened synovial membrane. These may be considered as benign neoplasms.

Loose bodies in the elbow have been observed following hypertrophic arthritis and osteochondromatosis.

In one case multiple bodies in the shoulder joint re-formed one year after their removal. The etiology was not established. J. I. MITCHELL.

**Wetterer, J.: The X-Ray Treatment of Malignant Growths** (Die Strahlenbehandlung der bösartigen Geschwulste). *Strahlentherapie*, 1920, x, 758.

In cases of inoperable tumors, in which it does not seem probable that X-ray therapy alone would be of benefit, as much of the tumor as possible should be removed by operation before the X-ray treatment is begun. Regional lymph-gland metastases following the removal of the primary tumor should be treated by the X-ray alone rather than by operation. This applies also to local recurrences. Every case operated on should receive X-ray treatment. In addition to the X-ray, radium also should be used in cases of malignant tumors. Under certain circumstances even chemicals such as enzytol and glandular extracts may be of value.

The harmful after-effects of X-ray therapy may be local or general. Deep brown pigmentation of the exposed field should be guarded against. Intensive treatment of the mucous surfaces easily leads to dangerous oedema. Sometimes in intensive treatment of large abdominal tumors a generalized circulatory disturbance may be produced, i.e., X-ray cachexia. Therefore it is recommended that such treatments be distributed over several days and that the blood be examined frequently.

The author denies that too-small doses may stimulate the growth of tumors, but advises against the use of small doses as their effect is overcome by the tumor's tendency to grow.

Regarding the indications for X-ray therapy for carcinomata in different locations, Wetterer is of the opinion that operation is more effective than the X-ray in cases of operable uterine cancers, but that



X-ray therapy is of great importance in preventing recurrence. Contrary to the majority of authors Wetterer believes that even in cases of sarcoma radical excision followed by X-ray treatment is the method of choice.

HARMS (Z).

**Quick, D.: Pre-Operative and Postoperative X-Ray in Carcinoma of the Breast.** *Am. J. Roentgenol.*, 1920, vii, 597.

Since the results of surgical treatment alone for breast cancer are far from reassuring, much is to be hoped for from other methods. The value of post-operative roentgen therapy has been attested by numerous authorities, as has also the importance of roentgen treatment of the open wound at the time of the surgical operation. The author believes still greater benefits may be derived from one or more cycles of roentgen therapy given both before and after operation. The formation of metastases would be rendered less probable by the tendency of the roentgen-ray to occlude the lymph channels along which metastases spread. In some instances inoperable cases may be rendered operable as a result of retrograde changes produced by radiation. An illustrative case is cited in detail.

At the Memorial Hospital within the last two or three years each case of primary breast cancer has been referred to the roentgen department for a complete cycle of treatment and in doubtful or borderline cases the decision regarding subsequent surgical intervention is delayed for a period of from two to four weeks. Before treatment is begun, a careful radiographic examination of the chest is made to determine, as far as possible, the status of the pleura and mediastinum. The cycle of treatment follows a routine plan up to a certain point and is then varied to meet the needs of the particular case. In all instances the involved breast and the pectoral, axillary, infraclavicular, and supraclavicular regions on the same side are treated as a routine. When the growth presents clinical evidence of malignancy, a wider field is covered so that the epigastric region, a wide skin area around the breast, the inner half or all of the opposite breast, and the opposite axilla and supraclavicular region are included. The skin over all available portals of entry is marked off into areas from  $2\frac{1}{2}$  to 3 in. square and massive doses are applied to each in the course of a number of days. The fixed factors in these exposures are an 8-in. skin-target distance, a  $9\frac{1}{2}$ -in. parallel spark-gap back-up, 7 ma. of current through the tube, and usually 4 mm. of aluminum filter.

After the cycle of treatment has been completed in this manner, the patient is placed under the observation of the surgeon and roentgen therapist. Cases belonging to the strictly operable class are operated upon two weeks after the completion of the roentgen cycle. Those more advanced are given another cycle of treatment at an interval of four weeks. After one or two cycles, some of the cases which were inoperable at first show sufficient improvement to place them in the operable group.

A study of the material removed at operation after this pre-operative treatment shows that the surgeon had a less malignant type of tumor to deal with. The neoplastic cells show marked degenerative changes, and the replacement of tumor tissue by fibrous tissue indicates a reparative process. The atrophy of lymphatic channels aids materially in blocking the dissemination of the disease.

Postoperative treatments are begun as soon as the patient is able to be out of bed following the radical operation. Three complete cycles are given at intervals of a month in exactly the same manner as the pre-operative radiation. Then, after from four to six months, a fourth cycle is given. In the extremely malignant types the monthly cycles are continued for some time.

ADOLPH HARTUNG.

**Dautwitz, F.: Contributions to Radium Treatment** (Beitraege zur Radiumbestrahlung). *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1920, xxxii, 297, 316.

Dautwitz reports the results he has obtained with radium in the last five years. He applies the radium in a flat container holding a large amount of the element and does not introduce it into the tumor itself or into wounds made by operation. For external use the maximum amount of radium should not exceed 100 mg. and the exposure should be from twelve to twenty hours. For vaginal and rectal use, up to 30 mg. of radium may be employed. The treatments should be separated by an interval at least eighteen hours in length and series of treatments should be separated by a period of at least six weeks. A schedule of dosage for the various diseases is impracticable because of the marked differences between the various cases.

Radium should not supplant surgical treatment or the X-ray altogether. There are cases, however, in which the X-ray is of no value while radium is beneficial. In the author's cases the damage done by radium was relatively slight, consisting, for example, merely of cicatricial muscular contractions following treatment of malignant tumors of the neck and, rarely, ulceration. Lupus and skin cancers, however, disappeared only after the development of a radium ulcer but the latter heals well, leaving only a fine scar. The results in cases of hæmangioma, tuberculous lymphoma, myelogenous and lymphatic leukemia, and splenomegaly were very good. They were good also in the anæmias and in cases of myomata and climacteric hæmorrhages. In cases of lupus erythematosus and vulgaris and carcinoma of the skin longer radium treatment was very effective; the scars became softer and more elastic, and Dupuytren's contracture was benefited. Good results were obtained also in cases of thyroid malignancy, inoperable carcinoma of the breast, and carcinoma of the lip, cheek, jaw, and larynx. In cancer of the tongue, however, they were poor. In cases of tumors of the rectum, stomach, and mediastinum radium therapy often ameliorated the symptoms, and in cases of lymphatic growths it delayed the course of the condition.

GRASHEY (Z).



**Bowing, H. H.: Topical Applications of Radium.**  
*Am. J. Roentgenol.*, 1920, vii, 582.

In the Mayo Clinic the terms "milligram hour," "erythema dose," "distance screening," etc. are used with reference to the application of radium. Milligram hours are determined by multiplying the amount of radium employed by the number of hours it is applied. An erythema dose represents 1,000 milligram hours of radium delivered to a square inch of skin surface at a distance of 1 in. and filtered through the silver wall of the applicator (0.5 mm.) and 2 mm. of lead. In the majority of cases there is no erythema, but if it does develop it is usually transient and responds readily to simple treatment. The term "distance screening" indicates that some substance, such as cork, wood, or gauze, has been interposed between the radium and the skin surface overlying the radiated area.

In treating primary carcinoma of the breast with or without metastasis a thorough radiation is indicated both before and after operation. Patients with recurring carcinoma of the breast with or without metastasis improve under radiation; at least ulceration and sloughing are prevented. An erythema dose is delivered to each square inch of skin surface overlying the growth and is repeated in six weeks until activity is no longer demonstrable. X-ray treatment is repeated every three weeks until eight or ten applications have been given, when it is stopped for three months.

The round-cell sarcoma responds readily and the melanotic sarcoma poorly to radium and X-ray therapy. The spindle-cell and giant-cell sarcomata respond more favorably than the melanotic type. Radium in erythema doses is applied over the involved areas and supported by the deep cross-fire method of X-ray treatment through the posterior and lateral abdominal and thoracic walls if the involvement is confined to the chest or abdominal cavities. This combined treatment is repeated every three months if necessary.

The application of radium is identical in cases of acute and chronic Hodgkin's disease, the treatment being given over the involved lymphatic groups in erythema doses. An enlarged spleen is treated by applying a 56-mg. tube over six areas for four hours in each area. If the roentgenogram shows thoracic, abdominal, or pelvic involvement, deep X-ray therapy is applied to these areas.

Simple tuberculous adenitis offers the best result when radium is applied in doses ranging from 500 to 1,000 milligram hours, depending on the size of the glands. General hygienic and dietary measures are also instituted. The treatment is repeated every six weeks until all signs of activity have disappeared. Large doses of radium are given in acute cases of splenomyelogenous leukemia in order to secure the development of the chronic state. The amount of radium used is 100 mg. in the acute cases and 50 mg. in the chronic cases. Six to eight areas are mapped out over the spleen and the radium is applied for four and three hours respectively. When there is

lymphatic enlargement radium is applied over each group for the same length of time. This treatment is repeated each week for three or four weeks. If the hæmoglobin and red cells decrease, the treatment is discontinued and a six weeks' rest is given. All patients are supported by medical treatment.

A. C. JOHNSON.

**Bagg, H. J.: The Action of Buried Tubes of Radium Emanation upon Normal and Neoplastic Tissues.**  
*Am. J. Roentgenol.*, 1920, vii, 536.

The author reports on the results of an investigation to answer the following questions which arose concerning the use of buried emanation tubes in tissues:

1. Is the effective area of radiation about the emanation tubes, i.e., the area in which the tumor cells were destined to undergo degenerative changes, the same for all practical therapeutic purposes for the tubes of 5 mc. strength (which was about the strongest tubes used) as for tubes of half that strength, or even for a fraction of 1 mc.? This question is of considerable practical importance from the standpoint of the most economical and efficient use of the available radium.

2. Assuming that the above question is answered and the practical dose has been determined, how far apart should the radium emanation tubes be placed to radiate efficiently a given mass of tumor tissue?

3. Do the various types of tissues exhibit about the same reaction to the same dose?

4. Do the clinical results show that properly distributed small doses of buried emanation produce the desired results with greater safety and less pain and discomfort to the patient than a comparatively large dose of radium per tube? And, in this connection, can tumor destruction be obtained without extensive sloughing?

The investigation was carried out by inserting small emanation tubes by means of a trocar into normal rat tissues, Flexner-Jobling rat carcinomata, and human carcinomata. The tubes varied in strength from 0.1 mc. to 5.5 mc. They were left in the normal animal tissues from thirteen days to several months, and in the Flexner-Jobling rat carcinomata for from twenty-four hours to several days, before histologic examinations were made. As controls for the experiments tubes which were recovered from previously treated tissues and had lost their radio-activity were again inserted by the same technique into other living tissues.

The author found that the area of radiated tissue does not increase in direct proportion to the amount of radium present, for when the radium was doubled the rays were not able to produce lethal effects twice as far into the tissues. When relatively strong tubes are used, the small depth of 5 mm. of tissue about the tube, i.e., 1 cm. in diameter, is radiated for a longer time than is necessary to produce the death of the cells. The effects of the gamma ray, which occur farther away from the tube and appear later, are no doubt somewhat greater when relatively



strong tubes, such as those containing 5 mc. of radium, are used than when tubes containing about 1 mc. are employed, but it has been difficult to test this point because of the prompt reduction in the total size of tumors treated in this way.

The localized effect of buried radium emanation was found to be practically the same in carcinoma of the prostate, experimental animal cancer, and normal tissues. In order to treat a given mass of tumor tissue effectively with an even distribution of radiation, the emanation tubes should be embedded about 1 cm. apart.

W. L. BROWN.

### MILITARY SURGERY

**Rottenstein, G., and Courboulès, R.: The Evolution of 270 Cases of War Fractures; Methods of Treatment and Results** (Sur 270 cas de suites éloignées de fractures de guerre; méthodes employées et résultats). *Presse méd.*, Par., 1920, xxviii, 846.

The authors have treated 270 soldiers suffering from the sequelæ of war fractures. Such conditions may be classified as: (1) fistulous osteomyelitis; (2) fistulæ without osteomyelitis; and (3) pseudarthroses with or without nerve lesions. In this article only the first two varieties are dealt with.

The great majority of these cases had been treated by débridement and extraction of foreign bodies. Primary suture had been done in only 10 or 12 instances. The persistence of osteitis cannot be attributed either to insufficiency of the primary operation or faulty technique. Most of the men had undergone secondary operations consisting of curettage and extraction of fragments. It appears to the authors that the persistence of fistulæ was due especially to insufficiency of the secondary operations.

Before fistulous osteomyelitis is treated antero-posterior and lateral radiographs should be made to determine the operative indications.

The operative incision greatly surpasses the presumed extent of the lesions. Wide and complete excision of cicatricial tissue and of any tissues which have undergone degeneration is necessary. The periosteum is stripped with an Ollier rugine. The osseous cavity having been exposed, its edges are abraded and all disease foci are removed. It may be necessary to make this intervention very extensive, continuing it even to the diaphyses of the bone. This first operative step is the same for all varieties of bone lesions. The following steps vary according to the nature of the lesion. If the affected area is very extensive and the opening is large, the cavity is tamponed for twenty-four hours with gauze wet with Dakin solution. At the first dressing a sufficient number of Carrel tubes to irrigate the entire lesioned area, even to the slightest recess, are inserted. The tubes are open at their extremity and every two hours a sufficient quantity of Dakin solution to give complete saturation is injected. Compresses are placed between the tubes

to prevent too rapid closure of the wound. At the end of a few weeks the open tubes are replaced by closed tubes which are left until complete cicatrization has occurred. In the authors' cases secondary sutures have never been necessary.

If the lesions are limited in extent and infection seems less severe, the muscles and aponeurosis are sutured over the Carrel tubes. The free extremities of the tubes are closed for the first twenty-four hours and the Dakin injections then begun.

In all cases of fistula without osteomyelitis and showing surface osteitis only, the wound was sutured over the inserted Carrel tubes. Recovery resulted.

Of the 270 patients treated by the authors, 92 had surface wounds only or had been operated upon recently and recovered without a second operation. The 178 others were treated by the methods described. Sixty-two returned to their homes in good condition, while 208 were transferred in good condition to prosthetic depots after a period of control of not less than six weeks following cicatrization.

W. A. BRENNAN.

### LEGAL MEDICINE

**Bosard, R. H.: A Few Words on Malpractice Suits.** *J.-Lancel*, 1921, n.s. xli, 38.

Fractures are the most common cause of malpractice suits. In certain cases, after treatment for some time, the physician instructs the patient to come back for an examination, but the patient lets the matter run for six months or a year and then, finding a poor result, goes to some other physician for the operation which his own negligence, rather than the fault or negligence of the surgeon, has made necessary.

In one case in which a fracture of the arm was reduced, the patient fell from a train three or four days later while intoxicated. When the physician was called he requested the patient to allow him to manipulate the arm to ascertain whether the fall had disturbed the bones. The patient refused to permit this, but finally consented to have an X-ray examination made. After removing the sling and outer bandages the physician left the patient and went into another room to adjust his X-ray machine. When he was ready for the examination, he found that the patient had left the office without the sling or bandages. The patient never returned, but eventually appeared at a lawyer's office with a bad arm and brought suit against the physician for malpractice. The physician had a record of his treatment with the dates, and the date at which the patient called after the fall. Moreover, there had been two persons in his office who remembered distinctly the patient's statements as to his fall, his refusal to allow the physician to manipulate the arm, and his consent to have the X-ray picture taken, who saw the sling and bandages removed, and who knew that the patient left the office before anything further could be done. This case was finally dismissed.



It is important for every physician and surgeon, therefore, to keep his records up to date so that matters therein to be contained, such as dates, conditions, symptoms, treatment, etc., and, in cases of fracture, occurrences such as falls, too early use of the limb, or any happening apt to cause a poor result without fault on the part of the physician, and the names of persons who knew of the facts at the time, may be set down before they are forgotten.

When a poor result is discovered, another physician should be called into consultation at once so that he may be acquainted with the facts, the history of the accident, the treatment, etc., and may view the result and judge from the facts and the result whether the treatment was proper and the attending physician was without negligence.

When a patient comes for consultation and the physician finds a defect due to a poor result from the reduction of a fracture, the physician should acquaint himself with the history of the accident, the treatment, etc. as shown by the record of the attending physician before he passes judgment on the treatment.

Ordinarily the plaintiff in a malpractice case must rely upon the testimony of a physician to prove negligence on the part of the defendant physician amounting to malpractice. The plaintiff proves his witnesses' preparation for his career, such as college degrees, hospital training, and general practice for a number of years. He then asks him what is termed a hypothetical question. This is supposed to embrace all of the facts which have been testified to in the case relative to the accident, injury, or illness, the physician's diagnosis, and the treatment. He then usually asks: "In your opinion was that treatment correct and proper for the injury or illness described?"

The witness must carefully analyze the question in all its aspects before giving his answer. It is possible, and in fact quite probable, that the facts stated are not sufficient to justify an opinion and in that case he very frequently answers: "I cannot answer that question." The witness may also point out to the counsel, in his answer, wherein the facts are not sufficiently definite to allow him to formulate an opinion as to whether the treatment was or was not proper. The plaintiff testifies as to what he claims to be the facts with reference to the accident, injury, or illness, and as to what he claims to be the facts with reference to the treatment given by the defendant physician. While this may be disputed by the physician in his defense, nevertheless, if the facts as stated by the plaintiff are all the facts in connection with the matter and are put in a hypothetical question, and if the witness is asked the hypothetical question and he answers that in his opinion such treatment would not be proper and that the poor result was, or might reasonably be considered as due to such treatment, the plaintiff has won his case.

The plaintiff may refer to the fact that he suffered an accident which resulted in a fracture of his fore-

arm; that the defendant physician, when called, did not at once attempt to reduce the fracture and replace the bones in their normal condition, did not apply a plaster of Paris cast, and applied loosely fitting splints only after a few days; and that eventually the arm reached its present condition. The physician called to testify must therefore be alert and, before expressing his opinion as to whether or not the treatment was or was not proper, should know what conditions confronted the defendant physician at the time he administered the treatment. If the facts are sufficient and the question is not sufficiently full to give the information, he is justified in stating that he cannot answer the question or that the treatment was probably correct.

There is also one other fact which must be borne in mind at all times by physicians who are called upon to give expert testimony. This is that when there are two or more known and used methods of treatment, one considered by some, possibly by all, as the best and most approved treatment, while the others are treatments which have been used and still are used to some extent and have been considered proper, even though they are not those most generally approved, he should be careful in considering that the treatment given was not proper treatment merely because it was not the treatment most approved and most recently developed.

The physician who is the defendant in the action is liable for malpractice for failure to use the ordinary skill and judgment of physicians in the vicinity in which he was practicing or in similar vicinities. A physician in a rural district where he does not have access to X-ray apparatus and other improved means of determining the exact condition and rendering treatment accordingly would not be held to the same degree of care and skill as the physician who is practicing in a city hospital with all the latest appliances at his command. A physician is not liable strictly for an error in judgment if he has made a careful examination and diagnosis and determines upon a certain method of treating the particular ailment or injury as the best in his judgment under all the circumstances. If the physician testifying prefers some other method of treatment he is not justified in condemning his fellow practitioner for deciding otherwise on the facts when both treatments are universally used.

J. A. CASTAGNINO.

#### **Evidence of Other Surgeons as to Care and Skill.** *Shaw vs. Klein (Miss.), 83 So. R., p. 620.*

A physician and surgeon performed a minor surgical operation and the patient instituted suit for damages because of alleged negligence. Judgment was rendered in favor of the physician. The patient, however, claimed error was committed in the trial because several surgeons testified that the defendant was a careful and skillful surgeon. The Supreme Court of Mississippi held this was proper.

J. A. CASTAGNINO.



**Liability from Loss of Drainage Tube Not Shown—**

**Evidence.** *Burris vs. Titzell* (Iowa), 177 N.W.R., p. 557.

The plaintiff in this case had been affected with pleurisy and pneumonia. A surgical operation was performed with an aspirating needle to drain the pus in the pleural cavity. The local physician drained a quart of pus from the cavity but found the disease difficult to treat as it had been preceded by alcoholism. The patient then went to the State hospital at Iowa City where she was treated by the defendant. He diagnosed her condition as empyema. An incision about 2 in. long was made between the seventh and eighth ribs and a drainage tube inserted. The tube was fastened to the patient's body by suture. The physician saw the patient

twice daily but the wound was dressed by nurses and internes.

About ten days after the insertion of the drainage tube its disappearance was discovered. The plaintiff claimed that the defendant placed the tube carelessly and negligently. It was disclosed by the evidence, however, that the tube was properly placed. The manner in which it escaped was unknown.

Inasmuch as the plaintiff's claim was that the tube was insecurely fastened and the trial court permitted evidence to be given that the wound was dressed by nurses and internes with the physician's consent, the Supreme Court of Iowa reversed a verdict rendered in favor of the patient.

J. A. CASTAGNINO.



## GYNECOLOGY

### UTERUS

**Haret and Grunkraut: The Raised Pelvis in the Radiotherapy of Uterine Fibromyomata** (De la position du bassin relevé dans la radiothérapie du fibromyome utérin). *Presse méd.*, Par., 1920, xxviii, 877.

The authors draw attention to the advantages offered by the Trendelenburg and genu-pectoral positions in the radiotherapy of uterine fibromyomata. In either one of these positions the abdomen is emptied as the small intestines fall into the diaphragmatic cavity and nothing intervenes between the abdominal wall and the pelvic organs.

Besides giving a clearer view, these positions are of value because they protect the small intestine against the X-rays. The importance of such protection is no longer a matter to be demonstrated. Vomiting, abdominal meteorism, diarrhoea, and collapse have been reported after X-ray treatment of the pelvic organs, and in 1917 one case of death due to intestinal lesions caused by the X-ray was reported. The glandular and lymphatic nature of the small intestine explains its susceptibility to the rays.

The Trendelenburg position should be chosen when the radiotherapy is to be given by the anterior route, and the genu-pectoral position when it is to be given by the posterior route.

In either case the operator should be assured first of the mobility of the small intestine. This can be ascertained by radioscopy examination after a test meal and observing the position of the intestine when the patient is in dorsal decubitus and then with the pelvis raised. W. A. BRENNAN.

**Wood, J. C.: Cervical Tears.** *J. Am. Inst. Homæop.*, 1920, xiii, 515.

In this article the importance of repairing cervical tears is discussed and the following modified trachelorrhaphy is presented:

Either lip of the cervix is grasped with a small volsellum forceps. The upper angle of the cervical tear on one side is secured in a third forceps, and with a scalpel a double V-shaped incision is made. The apex of the second V approaches the center of the lips in such a way as to undermine the mucous membrane of one side with the exception of the portion which lies immediately beneath the cervical canal to be created. A sufficient amount of the interstitial tissue is removed with this plug to restore the cervix to its normal size. If nearly all of the diseased tissue is removed, the two lips are easily approximated with through-and-through catgut sutures so that the entire operation may be performed easily in from ten to fifteen minutes.

Not all of the diseased tissue can be removed because a few distended glands will necessarily remain immediately underneath the newly created cervical canal. Fortunately, however, these disappear as the circulation of the cervix is restored, and a perfectly normal cervix as regards both size and function remains. C. H. DAVIS.

**Gonzalez, J. B.: Longitudinal Ruptures of the Inferior Segment of the Uterus** (Las roturas longitudinales del segmento inferior del utero). *Semana méd.*, 1920, xxvii, 813.

The technique employed by Gonzalez in the repair of longitudinal ruptures of the inferior segment of the uterus is described as follows:

The anterior and posterior lips of the cervix are seized near the edge of the rupture with cervical forceps with four teeth. The operative field is illuminated by the use of two single-valved vaginal specula. A guiding hand, usually the left, is then introduced.

The posterior margin of the rupture is caught close to its upper limit with a forceps with two teeth. It is important to include the entire thickness of the uterine wall. The opposite margin of the rupture is then caught somewhat lower down with another forceps.

Sutures are next introduced, beginning usually within a centimeter of the upper limit and crossing each border separately, the point of the needle always being protected with the index finger of the guiding hand so that no tissues of neighboring organs will be included in the suture. The higher forceps is shifted below the lower as the sutures are continued downward.

When the uterine body is not well contracted, a gauze pack is inserted into the entire uterine cavity. Otherwise the lower segment only is packed. The pack should be loose or tight depending upon whether drainage or compression is desired.

In cases of hæmorrhage which cannot be controlled by the usual procedures the author delays suture and applies a special forceps with four teeth along the borders of the rupture until bleeding ceases. In this case the forceps should include the entire length of the rupture and the entire thickness of the uterine wall. When hæmostasis is complete the rupture is repaired as described. W. R. MEEKER.

**Fowler, W. F.: Cervical Laceration, Cystocele, Prolapsus Uteri, and Multiple Fibromata.** *N. York M. J.*, 1920, cxii, 712.

In the case reported the Mayo procedure for cystocele and uterine prolapse was used. The tubes and ovaries were not removed. The operation was prolonged because of the difficulty in the hysterectomy.



tomy due to the situation of the fibroids and because it was decided to wait ten days before repairing the perineum. Recovery from both operations was uncomplicated.

On the basis of the results of the treatment in this case and a careful study of the literature the author draws the following conclusions:

1. A thorough gynecological examination three months after delivery should be routine practice.

2. The disability following cervical laceration is dependent upon subsequent pathologic conditions rather than upon the tear *per se*.

3. Premature or precipitate labors following amputation of the cervix are probably due to some other factor than the loss of tissue.

4. Operative morbidity and mortality will be decreased by the substitution of a several-stage operation for one prolonged operation.

5. The advisability of conserving the normal ovaries in hysterectomy is still undetermined.

R. T. LA VAKE.

**Bissell, D.: The Management of the Cervical Stump and the Round and Broad Ligaments When Performing Supravaginal Hysterectomy.** *Surg., Gynec. & Obst.*, 1920, xxxi, 578.

The following conclusions are drawn:

1. If the action of the round ligaments when they are anchored to the cervical stump effects a change in the position of the cervix, this change of position must be toward the symphysis and from the coccyx, and as the normal position of the cervix is in the immediate region of the coccyx, any marked change of its position toward the symphysis constitutes a displacement.

2. If, when the round ligaments are anchored to the normally situated cervix, the position of the cervix after operation is found to be maintained, it is proof that the anchored round ligaments have had no influence upon the position of the cervix as the direction of this influence, if any, must be toward the symphysis.

3. A normal fascial diaphragm maintains the cervix in a normal position independently. Its action is constant and its resistance greater than that of the round ligament. Therefore the influence of the anchored round ligaments upon the cervix must be nil when the fascial pelvic diaphragm is normal.

4. If the posterior area of the fascial diaphragm is stretched by a retroposed corpus or a tumor in the cul-de-sac of Douglas so as to advance the cervix toward the symphysis, shortening the uterosacral or posterior ligaments is a more logical procedure than anchoring the round ligaments to the cervical stump.

5. If the entire fascial diaphragm has been injured sufficiently to permit the cervix to advance and descend toward the vulva and if an intra-abdominal removal of the corpus is deemed advisable, the corpus should be removed without reference to the position of the cervix, the vaginal vault

being corrected subsequently by overlapping the fascia of the anterior vaginal wall.

6. No adequate proof has yet been offered to show that the round ligaments, when anchored to the cervix, maintain in the slightest degree the normal position of the cervix or restore a displaced cervix to normal.

7. Prolapse of the cervix does not and cannot occur after supravaginal hysterectomy if previous to the operation the fascial diaphragm is uninjured and the cervix is in normal position. C. H. DAVIS.

**Gibson, G.: Cancer of the Uterus in Young Women.** *Am. J. Obst. & Gynec.*, 1920, i, 273.

The author reports six cases. One of the striking points in the histories is the fact that the first four patients all married early, at 19, 17, 16, and 17 years of age, respectively. Of the five who have borne children, four developed the cancer comparatively soon after a pregnancy, sixteen months, three and one-half years, four years, and five months.

In only three of the cases was it possible to perform a radical operation with any hope of success, and in these the disease had given rise to symptoms for a comparatively short time, three months, two months, and two months respectively. In the first there was beginning infiltration into the parametrium.

In the three other cases only a palliative operation could be considered and death resulted soon afterward. In these the symptoms had been present for four months, five months, and six months, respectively.

The following conclusions are drawn:

1. Cancer of the cervix occurs with sufficient frequency in young women to make it imperative to keep the condition in mind.

2. Epithelioma is the type generally found.

3. The growth is much more rapid in young persons than in older persons and a radical operation is possible only when the case is seen in the first three months.

4. The extension is especially rapid when the parametrium becomes involved, and death follows comparatively soon. E. L. CORNELL.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Coventry, W. A.: Lutein Cysts Accompanying Hydatiform Mole.** *Am. J. Obst. & Gynec.*, 1920, i, 266.

Two cases showing several very interesting features are presented. In one there were very large multilocular cysts in each ovary which somewhat clouded the development of the mole. In the other case two large tumors the size of a fist were found one month after the removal of the mole. The uterus was large and flabby and about the size of a two months' pregnancy. A hysterectomy was done.

In both their gross and their microscopic appearance these cysts differed decidedly from the ordinary type of ovarian cysts and from the lutein cysts



normally appearing during pregnancy. Undoubtedly they accompany only the formation of chorion epithelioma and mole.

The author finds in the literature many references to cysts of the ovaries in association with pregnancy, mole, or chorioma, and small cysts which disappeared spontaneously after expulsion of the mole or foetus. Cysts such as he describes in this article, however, are uncommon.

The treatment consists of operation. In Coventry's opinion the surgeon is justified in not waiting for recession of the tumor. E. L. CORNELL.

#### EXTERNAL GENITALIA

**Eastman, J. R.: Silver Wire in Vesicovaginal Fistula.** *J. Indiana M. Ass.*, 1920, xiii, 393.

Eastman states that, regardless of the type of operation, silver wire is superior to any form of catgut for the repair of vesicovaginal fistulae. He has carried out several experiments in an effort to determine why this is true, but has failed to prove anything definite. He concludes, however, that silver wire stimulates the tissues.

A description is given of the author's retention catheter in which the usual olive tip is replaced by four hoops which retain the catheter in position without obstructing its lumen. W. H. CARY.

#### MISCELLANEOUS

**Engelbach, W.: Endocrine Amenorrhœa.** *Med. Clin. N. Am.*, 1920, iv, 665.

In 4 cases used for demonstration by the author the chief complaint was amenorrhœa. In 2 of these cases the condition was due to pituitary insufficiency; in the third, to ovarian insufficiency; and in the fourth, to thyroid insufficiency. Only classical cases in which there was a decrease in the secretion of these endocrine glands sufficient to produce amenorrhœa of some duration were selected. Three of the patients were 18 years of age.

These frankly positive cases were chosen in order to demonstrate as forcibly as possible the gross diagnostic points denoting insufficiency of the three important endocrine organs mentioned and to emphasize the influence of their secretion upon menstruation and genital function.

The strikingly complete insufficiencies described by the author are not common, but minor degrees of deficiency in each of the glands mentioned resulting in less complete suppression of the menses, dysmenorrhœa, metrorrhagia, loss of libido, frigidity, and sterility are among the most frequent complaints of female patients. A careful study of the classical and extremely conspicuous "hormonic signs" noted in the cases presented was helpful in the diagnosis of the milder forms. Moreover, it supplied much information concerning the inter-relationship of the endocrine glands and the hormonal effects of their secretions upon other organs and metabolic processes.

The author is confident of the correctness of the diagnosis in the cases presented as those due to pituitary insufficiency were counterparts of similar clinical cases reported by Lorain, Levi, Bell, Rennie, Kuemmell, and Falta. These patients had the very unusual combination of a markedly arrested osseous and genital development, amenorrhœa, and the absence of other genital functions without the adiposity of Froelich's disease. This syndrome is explained only by one endocrine dystrophy, viz., insufficiency of the anterior lobe of the pituitary gland without additional involvement of the posterior lobe of the hypophysis. In the case due to thyroid insufficiency the history and all the minute markings were those of a pre-adolescent insufficiency of the thyroid associated with long periods of amenorrhœa which reacts completely to simple thyroid treatment. The case due to ovarian insufficiency was a case of extreme gonadism with the most classical osseous anomalies of this disorder and a refractory amenorrhœa of more than two years' duration. Various other symptoms, such as pernicious vomiting, emaciation, and angioneurotic œdema, were also present. The patient reacted to treatment with ovarian substance. The three types are described simultaneously in order to accentuate, by contrast, the difference in the hormonal signs characterizing these disorders. All local causes for amenorrhœa were excluded by repeated examination and in one case an exploratory operation was performed.

The treatment of the menstrual disorders described consisted of simple exhibition of the deficient hormone in sufficient dosage. In the majority of the cases of adolescent hypothyroidism increasing doses of thyroid were given by mouth until the maximum dose tolerated was reached or the symptoms were relieved. The earliest sign of thyroid intoxication was taken to be a tachycardia above 100, providing the pulse rate was below 80 before the institution of treatment. This tachycardia was considered the best physical measure of the patient's tolerance. The dose tolerated was usually decreased by  $\frac{1}{4}$  or  $\frac{1}{2}$  gr. and then continued for a few weeks to obtain further information regarding its effects upon the symptoms. At this time, if the general symptoms had not been improved, the basal metabolic rate was determined to discover whether it had been restored to normal. If it had been restored to normal, the dosage given was believed to be correct and the same treatment was continued for a number of months. If material improvement was not noted at the end of two or three months a re-examination was indicated to determine the correctness of the diagnosis. If the symptoms were relieved by a smaller dose it was found best to use the smallest dose which would give relief. The author states that he is uncertain whether or not, after the symptoms have disappeared and the periods have been restored to normal, it is advisable to increase the dosage to the point necessary to restore the basal metabolic rate.



In the treatment of the eunuchoid female a different rule was followed in measuring the dose of ovarian substance indicated in the individual case. In such cases the basal metabolism did not serve as an index to the dosage, and the only dependable guide was the reaction to this therapy in the form of improvement in the clinical syndrome.

Various preparations made by a number of pharmaceutical manufacturers are on the market under different names. "Ovarian substance," made from the corpus luteum and stroma of the ovary, contains both the internal and external secretions of the ovary.

The results obtained by the author have led him to the conclusion that the thermic test is of little value in the diagnosis or as a measure of the dosage necessary. If at any time the pituitary symptoms are increased, he stops the treatment. For example, typical pituitary headache or an exaggeration of the ocular, gastric, or uterine signs following the injection of this extract indicate that a mistake has been made regarding the activity of the secretions of this lobe, hypersecretion instead of a hyposecretion being present. On the other hand, if the relief of symptoms is very marked, there being freedom from attacks of cranial, ocular, and gastric symptoms for long intervals, marked relief of muscle fatigue, regularity and increase in the amount and duration of the menses, improvement in libido, and improvement or relief of sterility, it is proof of the beneficial effect of this medication. G. E. BELLBY.

**Smith, R. R.: Hæmorrhages into the Pelvic Cavity Other Than Those of Ectopic Pregnancy. *Am. J. Obst. & Gynec.*, 1920, i, 240.**

Except in cases of tubal pregnancy the ovaries give rise to intraperitoneal bleeding more frequently than any other of the pelvic organs or structures. There is apparently a good reason for this as they have little firmness, their blood supply is large, and they are in a constant state of morphologic and

functional change from puberty to the menopause. Menstruation and ovulation with extrusion of the ovum occur each month. At this time the follicle fills with blood. The pelvic organs are congested during menstruation and to a lesser degree during coitus. Displacements of the uterus and large tumors in the pelvis are apt to favor ovarian hæmorrhage by blocking the return circulation.

Clinically the cases of ovarian hæmorrhage may be divided into three groups: (1) those due to rupture of the normal graafian follicle or corpus luteum; (2) those due to a condition known as "hæmatoma ovarii"; and (3) those occurring in ovarian cysts or solid tumors. Several cases are reported.

E. L. CORNELL.

**Ogilvy, W. A.: The Afferent Nerve Supply of the Female Genito-Urinary Organs and the Bowel. *Practitioner*, 1920, cv, 421.**

A more definite knowledge of the afferent nerve supply of the viscera would simplify the earlier diagnosis of disease for the practitioner and enable him to seek the assistance of the surgeon at the time when the greatest good can be obtained by operative measures.

It appears that the tenth thoracic nerve supplies the functioning portion of the kidney, the ovary, and the small bowel, all of which are highly functioning structures; the eleventh thoracic nerve supplies the upper branching extremity of the ureter, the uterine tube, and the ascending and transverse colon; the twelfth thoracic nerve supplies the ureter, the uterus, and the descending and sigmoid colon, all of which are comparatively passive carriers except that the large bowel has an absorbing function; the first lumbar nerve supplies the bladder, rectum, and uterus, all of which are organs of convenience; and the third and fourth sacral nerves supply the trigone and urethra, the os, the vagina, and the anal canal, all of which are outlets.

E. L. CORNELL.



## OBSTETRICS

### PREGNANCY AND ITS COMPLICATIONS

Litzenberg, J. C.: *Microscopic Studies of Tubal Pregnancy*. *Am. J. Obst. & Gynec.*, 1920, i, 223.

As the uterus and tubes are genetically identical and therefore composed of the same tissues the same reaction to pregnancy might be expected in the uterine and tubal elements. Careful observations demonstrate that the physiological scheme is followed exactly in both the uterus and the tube; in the latter, however, the results are pathologic from the beginning because the ovum is implanted in an organ entirely unfitted anatomically for its reception or development.

In a series of cases studied decidual cells were always found in the basal layer but in some specimens only after laborious hunting through numerous serial sections. However, even though decidual cells may be found in the area called "decidua basalis," true decidua is never present. In the tube, on account of the absence of decidua, there is erosion of the unprotected dilated vessels in the musculature, causing a hæmorrhage in the intervillous spaces instead of a normal blood supply. This hæmorrhage is sometimes so profuse that the villi are displaced and crushed together, the ovum capsule is distended beyond its ability to resist, and the blood bursts through into the tube lumen.

The author has found decidual cells more frequently in the capsularis than in the basalis in spite of the fact that hæmorrhage is constantly present in the capsularis and masks the cell elements. That there is a capsularis which is the analogue of the decidua capsularis of the uterus is shown.

The "inner ovum capsule," as it has been well called, is inherently weak, does not expand and grow with the ovum as does the true decidua, and is also further weakened by eroding villi. Hence it ruptures easily.

The fact that the ovum of an extra-uterine pregnancy is frequently found protruding through the ostium abdominale of the tube is due usually, not to the expulsion of a separated ovum by the tube, but to the fact that in such cases the implantation of the ovum has occurred near the fimbriated extremity. The ovum is protruding, not because it is separated and being expelled, but because it is pushing through the end of the tube by virtue of its own growth and enlargement. This slowly dilates the abdominal opening of the tube and the ovum is not separated from the original site of implantation.

If the implantation is nearer the uterine end of the tube the termination will be either "external rupture" of the ovum capsule through the tube wall into the abdominal cavity or "internal rupture"

through the inner ovum capsule into the tube lumen or, rarely, separation of the ovum, in which case it perishes and may become a tubal mole or may be pushed along toward the fimbriated end by the hæmorrhage but not by muscular action of the tube. In the author's opinion true abortion is rare. "Internal rupture" is a better term than "tubal abortion" for, although in a great majority of so-called unruptured tubes, hæmorrhage into the tube and from the ostium abdominale is the rule, it is not always due to separation of the ovum as in uterine abortion.

"External rupture" may be a true bursting of the weakened eroded tube wall under pressure from within due to the growth of the ovum or the distention caused by hæmorrhage, or it may be only an erosion by the villi. In the latter case the wound may be very small but death may result because a large vessel is opened. E. L. CORNELL.

Cron, R. S.: *Glycosuria During Pregnancy*. *Am. J. Obst. & Gynec.*, 1920, i, 276.

The author summarizes his article as follows:

A positive reaction with Fehling's solution during pregnancy does not necessarily indicate the presence of diabetes mellitus, being due usually to a lactosuria or alimentary glycosuria.

Lactosuria is common during both pregnancy and the puerperium. It is entirely physiological and must be differentiated from the various types of glycosuria.

A large number (from 30 to 50 per cent) of pregnant women are less tolerant to glucose than non-pregnant women. They have no hyperglycæmia and are not true diabetics.

Glycosuria may be due to a lowering of the renal threshold for sugar. Albuminuria and glycosuria may be associated with one another or alternate in the absence of hyperglycæmia.

Diabetes and albuminuria may be associated with one another. This complication in pregnancy is ominous and calls for immediate interruption of the pregnancy.

Diabetes and syphilis may complicate pregnancy. The treatment indicated is both dietary and antiluetic.

Pregnancy may occur in diabetic women and diabetes may become manifest during pregnancy. Either is a serious complication. Many patients progress well, but a considerable percentage die in coma or collapse or succumb to some intercurrent infection or during a successive pregnancy.

Leaving out of consideration abortions and premature deliveries, about 50 per cent of the fœtuses of diabetics are still-born or die within a few days following birth.



Fat is the most important factor in the production of acidosis. It should be reduced to a minimum or omitted from the diet entirely. Its only value is to meet the patient's caloric requirement.

If sugar appears to a slight degree in the urine of a pregnant woman it should be carefully watched and controlled by diet and, unless a carbohydrate equilibrium can be maintained, the pregnancy should be terminated. The advantages of the cesarean section under gas-oxygen should be kept in mind.

Six cases are cited.

E. L. CORNELL.

**Durr, S. A.: Pregnancy Complicated by Influenza.** *Surg., Gynec. & Obst.*, 1920, xxxi, 610.

During the recent recurrence of epidemic influenza there were 53 cases of acute epidemic respiratory infection among the pregnant women in Cook County Hospital, Chicago. These cases, together with a similar but larger group reported by Woolston and Conley, form the basis of this article.

The maternal mortality was about the same as in the epidemic of 1918-19.

The mortality and morbidity, while small in cases of influenza, were much greater when bronchopneumonia was a complication.

The incidence of abortion and pneumonia is greatly decreased by keeping the patients in bed from the time the diagnosis is made until recovery is complete.

Abortion is caused by toxæmia or insufficient oxygen in the maternal blood. Physical exertion is a contributory factor.

The virulence of the epidemic decreased steadily and markedly.

E. L. CORNELL.

**Durst: Pregnancy Complicated by Pulmonary and Laryngeal Tuberculosis and the Advisability of Inducing Abortion Because of These Complications** (Komplikationen der Graviditæt mit der Lungen- und Larynx-tuberkulose und die Frage des artifiziiellen Abortus in Bezug auf diese Komplikationen). *Liječ. vijes.*, 1920, xlii, 144.

This article is a clear exposition of the development, history, and present views regarding the subject. There are three theories. At one extreme are those who believe that tuberculosis is never an indication for induced abortion, while at the other extreme are those who consider pulmonary tuberculosis in any stage or form always an indication for abortion. Between these extremes there is a third group of authors who believe that under certain conditions and in certain cases the induction of abortion is permissible or necessary. This viewpoint prevails today and is upheld by the author. In Durst's opinion latent pulmonary tuberculosis is not an indication for an induced abortion but active pulmonary tuberculosis, especially during the first four months of pregnancy, constitutes a definite indication. In this connection the author makes a distinction between the pregnant woman in good circumstances whom he treats expectantly and the woman in poorer circumstances for whom more

active treatment is necessary. The opinion of an experienced internist should always be sought and followed. Tuberculosis of the larynx is always an absolute and urgent indication for the interruption of pregnancy.

Guided by these principles the author has induced 128 abortions in the cases of 117 women during a period of fourteen years. In these 128 abortions there were 2 premature labors (eighth and ninth months) and 8 late abortions (from the fifth to the seventh months); in all the others the abortion was performed between the second and fourth months. The relatively large number of abortions is explained by the fact that the maternity clinic in Zagreb is the only clinic for all of Jugoslavia. There were no deaths.

KOLIN (Z).

**Hillis, D. S.: The Treatment of Abortion.** *Surg., Gynec. & Obst.*, 1920, xxxi, 605.

Hillis contributes the results of a statistical study regarding the relative merits of operative and conservative treatment of abortion, the basis of his investigation being more than 200 cases treated at the Cook County Hospital, Chicago. Two separate groups were studied, septic and non-septic cases. Cases with a fever above 100 degrees which were curetted showed higher fever after operation and longer convalescence than septic cases treated conservatively. It was found, however, that curettage could be safely and advantageously performed in cases of this type after they had been free from fever for five days.

In regard to non-septic cases the author reaches the following conclusions:

1. Curettage is necessary in 40 per cent of cases treated expectantly.
2. Curettage insures an empty uterus and prevents subsequent bleeding.
3. It shortens the patient's stay in the hospital.
4. It is relatively harmless.

W. H. CARY.

**Vanverts, J.: Abstention or Operation in Complicated Abortions** (Abstention ou intervention dans les avortements compliqués?). *Rev. franc. de gynéc. et d'obst.*, 1920, xv, 361.

The author reviews 256 cases of abortion, 56 of which were treated by conservative measures and 200 by operation. The considerable number of operations is explained by the fact that the majority of the cases were complicated. The 56 cases treated by conservative measures were cases of simple abortion. The complicated cases may be placed in three classes according to the indication for intervention which was hæmorrhage, infection, or simple retention.

Hæmorrhage should be considered an indication for operation only if it is abundant. When the hæmorrhage is due to complete or incomplete retention it is impossible to give an absolute prognosis or to conclude that expulsion of the placenta will arrest the bleeding. Therefore it would seem wiser to evacuate the uterus as this is a sure method



of obtaining hæmostasis. The danger is slight if the evacuation is done according to accepted rules.

In 82 cases of curettage for hæmorrhage due to abortion there was only 1 death and this probably was due to delay in the treatment. Early intervention is necessary in all cases of severe hæmorrhage whether the ovum is still retained completely or there is retention of only a part of the placenta.

In cases of septic abortion it has been customary, at least in France, to empty the uterus. The author has not had any personal experience with conservative measures as in such cases he has always operated. In 99 cases of digital or instrumental curettage there were 93 recoveries and 6 deaths. The deaths were more frequent among cases of incomplete retention than those of complete retention. In 19 of these 99 cases the infection was not checked immediately by evacuation of the uterus. A pelvic abscess developed in 4, and in 2 cases a generalized peritonitis caused death. Emboli and phlegmasia developed in 1 case each. In 11 cases a generalized infection occurred. This was treated by turpentine injections; 6 of the patients recovered and 4 died. In one-fifth of the cases, therefore, evacuation of the uterus is insufficient to check infection, but it is incorrect to attribute to evacuation the complications which may ensue from a pre-existing sepsis. While the author limits himself to evacuation, he is of the opinion that other methods of treatment such as uterine drainage and hysterectomy have their proper indications.

In cases of retention systematic evacuation of the uterus obviates the dangers which are always present. In 9 cases which the author treated in this way recovery was normal. Vanverts is unable to understand what advantage there can be in conservative measures. Evacuation he believes is imperative if the placenta is not expelled by the end of twenty-four hours.

The objection that in evacuating the uterus there is danger of uterine perforation is well founded. The author has been obliged to perform a hysterectomy three times on account of this complication. As in all of these cases recovery followed, he does not believe that the fear of a perforation should change our opinion regarding the value of evacuation and the indications for the procedure.

W. A. BRENNAN.

#### LABOR AND ITS COMPLICATIONS

**Ricard, J. C. A.:** A Case of Dicephalus (Un cas de dicéphale). *Bull. méd. de Québec*, 1920, xxii, 65.

In Ricard's case two heads could be felt on abdominal palpation but only one heart was heard on auscultation. The first head was delivered in occipitopubic position, but it was impossible to effect the least movement of rotation. Intra-uterine exploration revealed a dead bicephaloid fetus, the second head of which rested on the inlet.

To complete the delivery it was decided to sacrifice the disengaged head. This having been

done, the labor was terminated after a simple podalic version. The first head delivered was normal but showed signs of asphyxia. The second head showed a hare-lip. The fetus was fully developed, and of the feminine sex. It weighed about 10 lb. The woman made a normal recovery.

W. A. BRENNAN.

#### PUERPERIUM AND ITS COMPLICATIONS

**Polak, J. O.:** The Indications for Operation in Spreading Peritonitis of Postabortal and Postpartal Origin. *Am. J. Obst. & Gynec.*, 1920, i, 161.

Polak calls attention to the complete anatomical isolation of the pelvis which generally occurs following postabortal and postpartal peritonitis. The Fowler position, which is so universally employed in the prophylactic treatment of lower abdominal and pelvic inflammations, favors localization of the process within the pelvic cavity. If it were not for the fact that protecting barriers, such as the sigmoid, cæcum, ileum, and omentum, wall off the infective process, postabortal and postpartal infections would cause a much higher mortality; a pelvic peritonitis would be apt to become a general peritonitis.

When the uterus is entirely within the confines of the true pelvic cavity, the body is usually able to take care of the infection. In puerperal peritonitis, however, the large subinvolved uterus blocks the organism's conservative measures in the localization of the infective process and general peritonitis is the result.

The author believes that if the symptoms of a spreading peritonitis appear when the usual conservative measures of treatment are employed, conservative treatment should be stopped and drainage should be instituted immediately, either vaginal or abdominal, depending upon the type of case.

From his study Polak has formulated the following conclusions:

1. In the large majority of peritoneal extensions the body is able to localize the lesions.
2. Advancing peritonitis has a definite syndrome which is constant when the inflammation is spreading.
3. In the presence of this syndrome drainage is necessary and definitely lowers the mortality.

H. B. MATTHEWS.

#### NEW-BORN

**Zerbino, V.:** Methylene Blue in the Treatment of Pyelitis in Infants (El azul de metileno en el tratamiento de la pielitis del lactante). *Rev. med. d. Uruguay*, 1920, xxiii, 526.

Zerbino gives the clinical histories of cases of typical pyelitis in infants in which good therapeutic results were obtained with methylene blue. This is almost a specific in certain infections due to dysenteriform bacilli and the fusiform bacillus



causing Vincent's angina. Since pyelitis in infancy is usually of intestinal origin and the organisms concerned are the bacillus coli and bacillus lactis aerogenes, the use of methylene blue in this condition appears logical.

The route chosen for its application is justifiable also for the same reasons. From the intestines methylene blue acts first upon the point of origin of the infection. After absorption by the intestinal mucosa it follows slowly the same path traveled by the original infection. It is easily and rapidly eliminated by the kidneys and its influence is exerted upon the entire urinary tract. W. R. MEEKER.

#### MISCELLANEOUS

**Kellogg, F. S.: The Unmarried Mother Before and After Confinement.** *Am. J. Obst. & Gynec.*, 1920, i, 292.

The author draws the following conclusions:

1. Illegitimacy is a State problem.
2. At present little or no progress is being made with this problem in this country.
3. Under present conditions the best form of care for high-grade illegitimates requiring care outside their own homes—with a few exceptions—is given by the well-equipped, well-staffed maternity home.
4. The worst form of care for illegitimates under present conditions—with a few exceptions—is that afforded by public lying-in hospitals and maternity wards in public or semi-public general hospitals as the women are usually taken in only when they are in labor and are discharged too early.

5. The best form of care under present conditions for low-grade illegitimates—with a few exceptions—is afforded by the State institutions.

6. The medical and social service standing of the maternity homes should be kept as efficient as possible by placing them under the supervision of a State Board of Illegitimacy.

7. The chief reasons for lack of progress are inadequate facilities for classifying and recording the end-results, and for co-ordinating effort and expense.

8. Such machinery might be provided by a central clearing house with a staff made up of a representative of each agency under the directorship of a long-time chairman and the necessary physicians, social workers, and clerks.

9. The cost of such a board should be supplied by the agencies interested, including the Commonwealth.

10. In addition to the fact that a clearing center would reserve only the woman worth working over for the more expensively run agencies, it would be of equal or greater value economically in obtaining early segregation and observation of a large number of mentally deficient women whose mental condition is evidenced first by their pregnancy.

11. The problem of illegitimacy is big enough to be handled and should be handled as an entity, being directed legally, sociologically and medically (loosely at first until knowledge is accumulated) under one office. Any legislation such, for example, as a Maternity Pension Bill, should not include clauses concerning illegitimacy because it will increase the present too-great decentralization.

E. L. CORNELL.



## GENITO-URINARY SURGERY

### ADRENAL, KIDNEY, AND URETER

**Legueu, F.:** *The Kidney Problem in General Surgery.* *Am. J. Surg.*, 1920, xxxiv, 309.

The author's experience leads him to conclude that deaths in his clinic are due to renal insufficiency as evidenced by nitrogen retention in the body. He discusses at some length Ambard's method of determining the normal kidney function and its variation in disease. The remainder of the article deals with the value of this method of estimating the kidney function in cases in which nephrectomy or prostatectomy seems indicated. Legueu gives the following rules regarding nephrectomy:

1. "If the constant is below 0,100 and the disease is unilateral, nephrectomy can be done in safety.

2. "If the constant is above 0,100, the lesions are bilateral, the gravity of the disease being in proportion to the increase of the constant. In this instance nephrectomy is not forbidden but it is necessary to pay great attention to the high figures of the constant."

In prostatic cases the rules for drawing conclusions from the coefficient are somewhat different:

1. "If the constant is above 0,200, it is preferable not to operate.

2. "If the constant is below 0,100, the condition is fairly favorable for operation.

3. "If the constant is between 0,100 and 0,200, the general condition of the patient must be the guide in formulating an opinion as to the advisability of operation. These are the most difficult cases and the constant cannot be considered alone. Proper preparatory treatment may change an inoperable case with a high constant to an operable case with a safe constant."

H. G. HAMER.

**Maxwell, L. A. I.:** *Renal Efficiency and Hyperglycæmia.* *Med. J. Australia*, 1920, ii, 551.

The normal percentage of sugar in the blood of healthy persons is subject to some variation, depending upon: (1) the amount and nature of the food ingested, (2) the time interval between the ingestion of the food and the blood analysis, and (3) the rate of conversion of glucose into more simple or more complex substances in the body.

MacLean regards 0.11 per cent as an average figure and many other observers give closely similar percentages.

Owing to faulty carbohydrate metabolism hyperglycæmia occurs in diabetes mellitus. Hyperglycæmia may lead to glycosuria, but obviously the elimination of glucose by the kidneys will depend upon the functional efficiency of these organs.

Pathologists have described a diffuse nephritis with fatty degeneration which occurs in diabetes. Hyaline changes are found in the tubal epithelium and the malpighian tufts.

The question as to whether in diabetes there is a change in the concentration of the blood was also investigated. Polydipsia would in itself tend to cause dilution of the blood stream, whereas polyuria would tend to cause its concentration. This problem was studied by the author in two ways: (1) the total solids of the blood were determined gravimetrically, and (2) the relative concentration of the serum in the different cases was determined by observing its refractive index. A further point investigated was the total fat and lipid content of the blood.

As a result of this study the following conclusions are drawn:

1. Renal inefficiency was present in 58 per cent of the diabetics examined.

2. In cases of hyperglycæmia the blood-sugar determination should be interpreted only in the light of the renal efficiency.

3. In about four-fifths of the diabetics studied there was concentration of the blood as shown by increased total solids and a raised refractive index.

4. Lipæmia was not a marked feature of the series of cases studied.

G. W. HOCHREIN.

**Rowlands, R. P.:** *Hydronephrosis Due to Abnormal Renal Vessels Kinking the Ureter.* *Proc. Roy. Soc. Med.*, Lond., 1920, xiv, Sect. Clin., 6.

Either a vein or artery or both passing toward the lower lobe of the kidney may hook the ureter and cause hydronephrosis. Almost invariably the abnormal vessels are derived from the main renal vessels. As a rule, but not always, they pass behind the ureter. They cause renal colic and intermittent hydronephrosis with little change in the urine. Renal calculi sometimes form in the dilated pelvis. Cystoscopy and pyelography may establish the diagnosis. Timely division of the offending vessels usually results in a cure, but in some cases ureteropelvic anastomosis is necessary to relieve secondary stricture or valvulation. In late cases nephrectomy may become necessary. The condition is little known and often overlooked even at operation.

The author presents the case of a married woman, 49 years of age. For eighteen years she has suffered with violent pain and swelling in the left loin. Seventeen years ago she had two operations: (1) tapping, (2) nephrorrhaphy. Relief followed for ten years. Since then she had had increasing attacks of pain and swelling in the left flank. The X-ray was negative as regards stone. The urine contained oxalate



crystals, a few pus cells, and a slight amount of albumin; bacillus coli was found on culture. The amount of urea in the blood was three times the normal. At operation the ureter was discovered to be constricted by an abnormal artery and vein passing behind it and kinking it at its juncture with the pelvis.

C. R. O'CROWLEY.

**Bard, L.: The Idiopathic Character of Pelvic Dilatation in Intermittent Hydronephrosis** (Du caractère idiopathique de la dilatation du bassin et dans l'hydronephrose dite intermittente). *J. d'urolog. med. et chir.*, 1920, ix, 243.

Retention of urine in the condition known as "intermittent hydronephrosis" has been attributed to the presence of an obstruction at the mouth of the ureter or within the ureter. Certain clinical facts and surgical and autopsy specimens, however, have led Bard to the conclusion that it is due to an idiopathic dilatation such as may occur in any tubular organ. From the pathogenesis of such a dilatation and the fact that the urinary retention develops late it seems evident that the dilatation is primary, that it was established originally without retention of urine, and that the obstructions usually present—stricture due to spasm or internal or external inflammation—are only indirect consequences of the progressive and continuous development of the dilatation itself.

In support of his views the author refers to a case of intermittent hydronephrosis characterized by the absence of obstruction and hypertension in its first phases, and by the secondary appearance of constrictions and distention due to obstruction resulting from the progressive development of the primary pocket.

W. A. BRENNAN.

**Quinby, W. C.: Tumors Primary in the Ureter.** *J. Urol.*, 1920, iv, 439.

The case reported was that of an unmarried woman, 40 years of age, who entered Peter Bent Brigham Hospital, Nov. 24, 1919. Her present illness began Nov. 7, 1919, when, after slightly unusual exertion, a dull aching pain was felt in the left side. This had been intermittent since, but never severe. There was no nausea, vomiting, fever, or bladder pain. As far as the patient was aware the urine was normal.

The physical examination revealed a very healthy appearing, middle-aged woman with no abnormality except that in the left side of the abdomen, below and external to the umbilicus, was a smooth, oval mass which did not move with respiration and was not tender but could be pushed about the abdominal cavity for a short distance with ease. Gastro-intestinal studies with the X-ray after the ingestion of barium gave no abnormal findings. The examination of the urine and blood was negative.

Cystoscopic examination showed the bladder to be normal and there was apparently a normal efflux of urine from each ureter. On the right side the

ureteral catheter passed for the usual distance without obstruction. On the left side, however, it was stopped at 14 cm. and from this side the flow of urine was very slow. A pyelogram made after injection showed the left kidney in its normal position, and below this a definite distortion and obstruction in the ureter which was curved upward and slightly dilated. The shadow ended in an abrupt tip opposite the iliac crest. The kidney was slightly enlarged and the ureter was somewhat dilated above the obstruction. There was no evidence whatever of infection in the urinary tract. From the appearance of the X-ray plate it appeared that only two conditions could cause the findings; first, an involvement of the ureter by some extra-ureteral infection such as a broken-down retroperitoneal gland, or second and more probable, definite involvement of the ureter by a neoplasm. Palpation of the mass in the flank showed it to be entirely distinct from the kidney.

Under a pre-operative diagnosis of neoplasm involving the left ureter an operation was performed on December 10, 1919, by Cutler. The peritoneal cavity was entered through the left rectus muscle, the intestines being retracted toward the midline. A definite tumor mass lying beneath the peritoneum just to the left and below the bifurcation of the aorta into the common iliac arteries was at once exposed. Immediately over the upper pole of this small tumor mass, which was as large as a baby's fist and very firmly attached, ran the mesentery of the large bowel containing the inferior mesenteric artery, and immediately to the right of the mass, overlying a portion of it, lay the iliac vein. The tumor was intimately adherent to the peritoneum.

Immediately overlying its anterior surface, and in the peritoneum itself, was an elaborate meshwork of fine vessels. Search on either side did not reveal the ureter, and it was decided to attempt enucleation, making a search for the ureter as the definition of the tumor mass progressed. The peritoneum was therefore incised in an elliptical fashion at either border of the tumor, all the fine vessels being clamped and tied off. When it was thus freed from the peritoneum by blunt dissection it was possible to free the mass from the surrounding structures, especially posteriorly where it was very definitely adherent although apparently it lay within a definite capsule of its own. This fixity seemed to be due to the fact that it lay in the center of a sympathetic plexus.

It was necessary to divide innumerable small fibers during the progress of the operation. Without breaking into the tumor, however, it was possible finally to free it on both sides and beneath without cutting any very large vessel. At this stage the ureter was encountered at both the lower and the upper ends of the tumor mass through which this structure passed. The attempt was made to dissect the ureter free from the tumor mass, but when this was practically completed it was seen that the tumor grew into or from the ureter so that it became evident



that this procedure would leave much of the lesion behind. Therefore the ureter was dissected downward toward the bladder as far as possible and cut across. Dissection was then carried upward toward the kidney end of the ureter, and when the normal ureter was encountered, it was cut across.

As the pathologic examination of the tumor showed it to be probably malignant and also possibly of renal origin, a nephrectomy was done ten days later. The kidney was found to be entirely normal.

On January 4, 1920, the patient was discharged from the hospital in excellent general condition. Recent examination showed no evidence of recurrence.

The tumor was a mesothelioma, probably of renal anlage origin. H. W. E. WALTHER.

#### BLADDER, URETHRA, AND PENIS

Ott, I.: A Rare Vesicopubic Penile Malformation (Di una rara malformazione vescico-pubopeniena) *Arch. ital. di chir.*, 1920, ii, 457.

The author reports a case of congenital vesicopubic malformation of the penis in a boy 10 years of age. The condition was clearly balanic epispadias. This type of epispadias is very rare as Burckhardt found only 5 cases of it in 60 cases of epispadias reported in the literature. The author's patient had a mass of cicatricial tissue about 2 cm. above the root of the penis. This represented the umbilicus and corresponded to the highest part of the urinary bladder. There was extrophy of the fundus of the bladder. The scar was flat or slightly embedded when the patient was in dorsal decubitus but prominent when the bladder was full. The lower part of the abdomen was short, the umbilical scar coinciding almost with the symphysis. Non-descent of the testicles, inguinal hernia, a pubic diastasis of about 7 cm., and minor pelvic malformations were noted.

The characteristics of this case resemble those noted in extrophy of the bladder. In discussing the evolution of the condition the author states that probably partial extrophy of the bladder, due to failure in the union of the pubic symphyses, and penile epispadias were present in the beginning and that these malformations were modified by intra-uterine cicatrization which covered the ectopic bladder partly with normal tissue and partly with cicatricial tissue and changed the penile epispadias into the less marked balanic epispadias.

The patient had been subjected to a Bassini operation for inguinal hernia but no operation had been done for the approximation of the pubic symphyses or for reduction of the abdominal hernia.

W. A. BRENNAN.

Watson, E. M.: The Developmental Basis for Certain Vesical Diverticula. *J. Am. M. Ass.*, 1920, lxxv, 1473.

The etiology of bladder diverticula has long been a subject of discussion among urological investigators. One school, to which Cabot belongs, contends

that they are always of congenital origin. The other, which includes Lower among its members, believes that these vesical evaginations are practically always acquired.

Watson has recently made a very interesting study of the development of the vesical cavity from early foetal life until birth. Variation and inequality of intrapelvic and lower abdominal pressure have been noted. This caused distortion of the bladder, its inner walls becoming extremely irregular with ridge-like elevations which stood out prominently in certain areas, especially in the zones about the lateral margins of the trigonum. The projections into the bladder were at times finger-like, and at others were simple ridges which never developed sufficiently to bridge the lumen of the bladder.

Watson contends that if the intrapelvic pressure becomes marked early in foetal life the probability of a bridging of the vesical cavity is greater than when it develops during the later months of intra-uterine life. Varying degrees of irregularity were demonstrated in the specimens studied. Many cross-sections of foetal bladders exhibiting these developmental defects are shown in the article. The author speaks of the factors which influence the size of such diverticula at birth. The fact that most of the diverticula were found in the region of the ureteral orifices he believes is due, not to the ureteral orifices themselves, but to the trigone which is covered at this time with from three to eight layers of epithelial cells. As these cell-layers thin out they show a marked tendency to project as slight ridge-like elevations which may go to form diverticula. The article presents strong arguments in favor of the theory that bladder diverticula are of congenital origin.

H. W. E. WALTHER.

Caulk, J. R.: Infiltration Anæsthesia of the Internal Vesical Orifice for the Removal of Minor Obstructions; Presentation of a Punch Cautery. *J. Urol.*, 1920, iv, 399.

Caulk has devised an instrument similar to the Young punch. The outer sheath has no fang on the slot to hold it in position as when the electric cautery is used the coagulation due to the burning maintains the instrument in place. The obturator sheath has at its terminus an iridioplatinum blade instead of a knife blade. This blade is about  $\frac{1}{4}$  in. wide and of substantial thickness. Caulk tried several smaller blades but they proved entirely unsatisfactory as they were too frail to withstand the pressure and the heat was imperfectly distributed. He has performed twenty punch operations with the blade described and it is still firm and in good condition. The blade is insulated from the main sheath of the instrument by mica plates. At the proximal end of the tube the current enters through a large contact point with screw attachment, one pole being connected with the tube itself and the other with a large copper bar brazed to the surface of the tube and insulated with silk and mica. The cord which carries the current from the rheostat



to the instrument is of large caliber and of practically the same size as the copper bar within the tube.

In order to burn tissue properly and prevent hæmorrhage the procedure must be carried out slowly under low heat. Otherwise the process is about the same as when a cold knife is used. As the heat in the blade must be sufficient to burn the tissue without heating the shaft of the instrument, the conductors in the author's instrument have been made large and of uniform caliber throughout so that they offer the minimum resistance to the current which is thus brought directly to the cautery blade, the only point of increased resistance. In this way an intense heat may be maintained for a sufficient period of time without heating the instrument. The inner sheath serves as a handle for manipulating the instrument. The burning is done best by a slow rotary motion. This is easily regulated by using the handle as a lever. There is no irrigating attachment to the instrument since dilation of the orifice is unnecessary and there is much less danger of short circuiting in a dry field.

With the Young punch the operation can be done nicely under local urethral anæsthesia induced with cocaine or novocaine for it is quickly over and the pain is tolerable. In an attempt to remove an obstruction with the cautery the procedure must be done slowly and a more profound anæsthesia is necessary. However, as the operative risks must be reduced to the minimum it is most desirable not to subject the patient to general or spinal anæsthesia. Sacral anæsthesia would be very effective for such operations, but this again falls into the category of major procedures. In observing the obstruction within the grasp of the instrument, it occurred to Caulk that it would be very simple to infiltrate the tissues of the orifice with novocaine through the outer sheath. Accordingly, he constructed a syringe somewhat on the order of the Geraghty utricle syringe. This instrument has a pistol handle connected with a tube (about a No. 7, French) to the end of which is brazed an iridioplatinum needle. An ordinary Luer syringe is connected with the silver tube at its juncture with the handle of the instrument. With this syringe the vesicle orifice may be easily infiltrated under the control of the eye. Caulk has used 1 per cent novocaine.

H. W. E. WALTHER.

**Thomas, B. A.: The Treatment of Bladder Tumors, with an Analysis of 62 Cases. J. Am. M. Ass., 1920, lxxv, 1395.**

Thomas claims there has been much dissatisfaction relative to the end-results in the treatment of bladder tumors, notably carcinoma, and that hopes are now entertained because of the promises of electricity and radium. The results of incisional forms of treatment in the past were so discouraging as to make bladder tumor cases unwelcome in the practice of surgeons, and not infrequently they precluded conscientious surgical intervention altogether.

The fundamental and all-important consideration as to the proper treatment of the various intravesical growths, benign or malignant—whether it should be electrical, operative, or palliative—should rest chiefly with the experienced cystoscopist, although indispensable assistance will be rendered by the cystogram, the histopathologic examination of an excised section of tissue, and the patient's general physical condition. The importance of a correct differential diagnosis of these bladder growths cannot be too strongly emphasized because thereon depends the proper line of treatment.

The author summarizes his plan of treatment as follows:

1. If the tumor is a polyp, hæmangioma, or papilloma, single or multiple, the treatment *par excellence* is cystoscopic fulguration or electrocoagulation with the Oudin or d'Arsonval high-frequency current.
2. In selected cases of early malignant tumors, especially those involving the vesical orifice, complete resection of the tumor-bearing area being impossible, it is desirable, after cystotomy, to destroy the growth by fulguration and then to implant radium in the tumor bed, employing needles, each containing 12.5 mg.
3. In cases of malignant growths favorably situated and not too far advanced, the first thought should be extraperitoneal resection or combined extraperitoneal and intraperitoneal resection of the portion of the bladder occupied by the carcinoma, one or both ureters being implanted if necessary. In the bladder, as in other organs of the body, surgical intervention for carcinoma should always be supplemented by intensive roentgen-ray cross-fire.
4. In the group of cases beyond the hope of cure by radical surgical procedures in which something must be done for the relief of distressing symptoms, fresh encouragement has been given by the use of multiple needles of small quantities of radium embedded in the growth. Following the destruction of all visible and palpable evidence of diseased tissue by fulguration through the cystotomy opening the radium needles are implanted throughout the tumor bed and left in place for from six to eighteen hours.

In the series of 62 cases reported there were 30 carcinomata, 25 papillomata, 6 polypi, and 1 hæmangioma. Carcinoma occurred at all ages from 44 to 80, papilloma from 33 to 72, polypi from 38 to 77, and hæmangioma at 70. The duration of symptoms varied from two weeks to twenty-five years. Blood, pus, urinary frequency, and dysuria constituted the danger signals from the urologic tract. Forty-two patients had received only medical treatment previously for months or years and 9 had had some form of surgical treatment, usually a cystotomy with attempted removal of the growth (recurrence invariably resulted, and not in a single instance was the procedure followed by a permanent cure). In 21 cases of papilloma, from one to nineteen treatments with the high-frequency current were required to destroy the growths (in many cases



the growths were multiple), and in approximately one-half of these cases a recurrence developed from one to ten times. In only 1 of the 4 cases of carcinoma treated by fulguration was the patient benefited.

Recently the author treated the affected area in the bladder for twenty-four hours with radium inserted through the urethra following the destruction of multiple papillomata with the high-frequency current.

The implantation of multiple needles with small amounts (12.5 mg.) of radium throughout the carcinomatous mass, instead of its removal or destruction by the high-frequency spark, followed by the application of large amounts of radium (from 50 to 100 mg.) has been employed so recently that a comparison of this method with others is premature. Cases in which resection of the bladder, with or without transplantation of the ureter, is practicable and advisable are comparatively few. Total cystectomy is likewise a hazardous procedure. Thomas performed it successfully, however, in 1 case of the series.

LOUIS GROSS.

**Neill, W.: Further Progress in the Treatment of Tumors of the Female Bladder.** *Am. J. Surg.*, 1920, xxxiv, 325.

Flat tumors with broad sessile bases the author treats by implanting directly into the growth small capillary glass tubes containing from 3 to 5 mc. of radium emanation. This treatment is not repeated under from four to six weeks. In addition, the tip of a sound containing the equivalent of 1 gm. of radium in the form of emanation rays is held upon the surface of the growth for from five to ten minutes. Simple papillomata are treated in the latter manner, the procedure being repeated once each week for four or five weeks. In applying these treatments the Kelly cystoscope is used.

H. G. HAMER.

**Kolischer, G.: Radium Therapy of Cancer of the Bladder and Prostate.** *Am. J. Surg.*, 1920, xxxiv, 323.

The author uses only gold filters in treating bladder tumors with radium. He emphasizes the importance of preparing the bladder properly for the reception of the radium and discusses in some detail the methods employed in meeting the various complications which influence the use of radium in these cases.

As to the time the radium is applied Kolischer distinguishes between primary application, raying following electrocoagulation of the tumor, and prophylactic raying secondary to excision of the growth.

In placing radium in the unopened bladder the author uses a No. 21 silver Charrière sound with a detachable hollow gold tip 3 mm. thick into which the glass container carrying the radio-active substance is placed. If the bladder has been opened he applies the radium by dropping it into the bladder through the suprapubic opening.

Fifty milligrams of radium or mesothorium are sufficient for the treatment of vesical or prostatic tumors, the results from a dose of this size being as good as those following larger doses.

If a few radium treatments do not produce decided improvement, it is useless to continue. Resort must then be had to electrocoagulation.

H. G. HAMER

**Ballenger, E. G., and Elder, O. F.: Notes on Urethral Strictures.** *Am. J. Surg.*, 1920, xxxiv, 340.

A urethral stricture is caused by inflammation or injury of the urethral wall which results in a deposit of fibrous tissue and narrowing of the canal. Strictures may be congenital or due to gonorrhœa, trauma, or the injection of strong chemical agents. They may be passable or impassable.

The more common symptoms are a decrease in the size of the urinary stream, urethral discharge, irritation, and disturbed sexual life. An acorn-shaped bougie is used for diagnosis.

Gradual gentle dilatation with sounds and a Kollman dilator at intervals of from one to five days causes absorption. Over-dilatation is followed by the formation of new scar tissue. Resilient strictures, strictures which do not respond to dilatation in a reasonable time, and strictures which are too extensive or too tight for dilatation are indications for internal urethrotomy in the anterior urethra.

External perineal urethrotomy is indicated in tight or resilient strictures of the deeper urethra and when infiltration or stone is present. A guide should be used if possible, but when it is impossible to pass a filiform bougie the structure may be bored through with the forefinger as advocated by Livermore or retrograde catheterization through a suprapubic opening may be done. A large retained catheter is used for ten days, with daily irrigations and later dilatation.

C. D. PICKRELL.

**Ravogli, A.: On the Strictures of the Male Urethra.** *Am. J. Surg.*, 1920, xxxiv, 334.

After a detailed discussion of the anatomy of the male urethra the author states that for the classification and description of strictures the urethra should be considered as having three portions, a prostatic, a membranous, and a spongy portion.

Strictures are either spasmodic or the result of inflammation. A spasmodic stricture is the contraction of the compressor urethræ seen in nervous persons or occurring after operation for hæmorrhoids and is not permanent. Filiform bougies will increase the irritation, while a good-sized catheter will pass easily. Hot sitz baths, opiates, and later dilatation to prevent recurrence are of value in the treatment. Silver nitrate 1:1,000 will decrease the sensitiveness.

The wide-caliber stricture of Otis consists of a contracting peri-urethral formation of fibrous tissue following the absorption of infiltration deposited in the submucous layer during inflammation. The



lumen of the urethra is not narrowed. When the infiltration heals and scar tissue forms, narrowing of the lumen results.

In a series of 320 cases reported by Thompson 54 strictures were between the meatus and a point  $2\frac{1}{2}$  in. above it on the pars pendula; 51 were in the middle of the pars pendula; 216 were in the sub-pubic curvature in the bulb and the membranous urethra. Increased vascularity and the urethral curve favor the latter regions. The abundance of follicles in the bulbar region favors exudation. The membranous urethra favors traumatic stricture.

According to Thompson and Martin, gonorrhœa causes from 75 to 85 per cent of all strictures. The others are traumatic.

A long-standing gleet, morning drop, shreds, symptoms of posterior urethritis, irritable bladder, frequency, frequent erections at night, and impotence are present in various degrees. The urinary stream decreases in size and force and may be divided or twisted. Pain may be present, either at the beginning or the end of urination or may be spasmodic. Alcohol or excessive intercourse may cause retention. Urethral dilatation, extravasation, abscesses, fistulae, cystitis, ureteritis, and pyelonephritis are possible complications.

The prognosis depends upon the nature and location of the stricture. Traumatic strictures contract rapidly, while gonorrhœal strictures contract slowly. Those in the perineal urethra are more difficult to treat than those in the pars pendula. A first-stage stricture is more easily dilated and more permanently cured than a second-stage stricture. Death may follow extravasation, abscess and gangrene formation, chronic uræmia, cachexia, etc.

The treatment consists of gentle and clean instrumentation. Dilatation should be gradual and accompanied by gentle massage. The author relies more upon sounds than upon a dilator. In tight, resisting strictures filiform bougies, soft rubber bougies, and electrolysis are used instead of steel sounds which may cause damage by tearing. Radium has been employed by Ayres with poor results. Cutting gives only temporary relief. External urethrotomy is indicated in impassable strictures. Instrumentation is followed by irrigation. Internal antiseptics are of value. C. D. PICKRELL.

## GENITAL ORGANS

**Kuemmell, H.:** The Two-Stage Prostatectomy for the Cure of the Most Severe Forms of Prostatic Hypertrophy and Renal Insufficiency (Die zweizeitige Prostatektomie zur Heilung der schwersten Formen der Prostatahypertrophie und Niereninsuffizienz). *Berl. klin. Wchnschr.*, 1920, lvii, 485.

Both methods of prostatectomy, the suprapubic and the perineal, have their advantages and disadvantages. The suprapubic method seems to have a higher mortality, but according to French authors improves potency and function so that the patient rejoices in a second youth.

The perineal method frequently causes incontinence and injury to the ejaculatory ducts. From 35 to 50 per cent of persons with prostatic hypertrophy who are not operated upon die of general cachexia, urosepsis, and especially of secondary renal disease. The latter is demonstrable by cryoscopy of the blood and the quantitative determination of indican in the blood.

To prevent the danger of renal insufficiency the author recommends the two-stage suprapubic method. Of 28 patients between 57 and 83 years of age operated upon by Kuemmell according to these principles all were cured except 1, an 80-year-old patient who died of pulmonary embolism three weeks after the second operation when the wound had entirely healed.

In the cases reported the secondary kidney insufficiency was overcome in from ten to fourteen days by the formation of a high bladder fistula and the cystitis was cleared up by irrigation. Twenty-four hours before the second operation the fistula was dilated by means of laminaria tents so that it was possible to introduce at least two fingers into the bladder to shell out the prostate. Before this, a retention catheter was introduced into the bladder. After direct injection of novocaine solution into the prostate and its surroundings the median lobe was pulled toward the wound by the left index finger which was inserted into the rectum and the prostate was shelled out with the right forefinger introduced into the funnel-like opening of the urethra. A retention catheter was then inserted and the bed of the prostate was tamponed loosely. An Irving capsule and a retention catheter introduced into the bladder fistula prevented soiling with urine and allowed the patient to get up soon after the operation. After two weeks the fistula which had been formed by suturing the vesical mucosa to the skin was freshened under local anæsthesia and closed secondarily. The dilatation of the vesical fistula by means of laminaria tents is painless. The operation described is well tolerated. JASTRAM (Z).

**Swartz, E. O., Shohl, A. T., and Davis, D. M.:** Certain Cultural Characteristics of the Gonococcus. *Bull. Johns Hopkins Hospital*, 1921, xxxi, 449.

As a result of studies made in the Johns Hopkins Hospital regarding the action of disinfectants on the gonococcus cultivated according to the method described by Swartz, the authors found it desirable to investigate its cultural characteristics.

Investigators have been generally in agreement upon certain points, but have differed regarding others. Thus the sugar reactions of the gonococcus and the morphology of its colonies were found by different workers to be the same. On the other hand, a number of quite different reactions have been recommended as the most suitable for the growth of the gonococcus, and while all have found the organisms to grow better in closed systems, the authors considered it doubtful whether this differ-



ence was due to lowered oxygen tension, increased carbon dioxide tension, a change in reaction due to carbon dioxide, or the abundance of moisture. The assumption that the gonococcus accustoms itself to plain media and becomes Gram-positive the authors consider very important, if true.

They generally followed these lines in their work, attempting also to determine for the gonococcus grown in sugar media an acid death-point like that described for the bacillus coli by Michaelis, Marcora, and Bruenn.

One strain of gonococcus in their series showed a very slight growth consisting of a few isolated colonies after being transplanted several times on the usual medium and then transplanted to plain agar containing no uncoagulated protein. A second transfer produced no growth. Aside from this instance, the organisms did not grow on plain media, either when freshly isolated or after many subcultures in the laboratory.

On solid media isolated colonies of the gonococcus which developed under unfavorable conditions of growth such as a too-high oxygen tension or the presence of small quantities of some germicidal substance presented the same appearances as those described by Martin and others. A translucent gray color by reflected light changing to a fairly clear light brown by transmitted light was found by them to be characteristic.

On liquid media consisting of two-thirds beef or veal infusion bouillon and one-third ascitic or hydrocele fluid the gonococcus grew well when the oxygen tension was lowered. After many subcultures some of the strains grew with less profusion on solid media and showed many involution forms. When such a strain was passed once or twice through liquid media the original profusion of growth was restored and the involution forms diminished.

The usual media used by the authors had a reaction of pH 7.4. It was found that the presence of moisture in the culture media was desirable, and indeed necessary, for profuse growth.

In order to determine the acid death-point for the gonococcus, cultures were made in liquid media containing 1, 2, or 3 per cent dextrose. After ten days' incubation all growth had ceased and there were no more living organisms. Hence, after the tubes had been left in the incubator for at least ten days the acidity of the media was tested colorimetrically and electrometrically.

The acid death-point determined for gonococci grown in dextrose ascitic fluid bouillon was found to be pH 5.6, the variations mentioned in the quantity of dextrose present making no difference. The gonococcus always produced acid when grown on its ordinary ascitic or hydrocele fluid beef or veal infusion agar, the final pH being 6.2. This medium was not especially rendered sugar-free, but contained no reducing substance for Fehling's solution.

From their study the authors draw the following conclusions:

The better growth of the gonococcus in closed systems, when part of the air or of the oxygen had been removed or replaced, was due essentially to the lowered oxygen tension, and not to moisture, change of reaction, or the presence of carbon dioxide.

Moisture was necessary for good growth.

A reduction in the oxygen tension of 10 per cent was sufficient to produce optimum growth.

If the oxygen tension was suitable and moisture and uncoagulated proteid were present, the gonococcus grew luxuriantly on media having an initial reaction anywhere between pH 6.6 and pH 8.0 inclusive.

In dextrose-containing media the acid end-point for the gonococcus was pH 5.6. G. E. BEILBY.



# SURGERY OF THE EYE AND EAR

## EYE

**Aránguez, M. E.: The Treatment of Blepharoptosis** (Tratamiento del blefaroptosis). *Pediat. españ.*, 1920, ix, 246.

Ptosis is caused by paralysis of the levator muscles of the eyelid due to arrested development or congenital deformity. The method of treatment may be surgical or non-surgical. Non-surgical treatment, however, has proved unsatisfactory. This is true as regards syphilitic treatment, electrical stimulation of the eyelid, and the use of mechanical devices to hold the lid relaxed as in the normal.

The object of all operations has been to retract the drooping, thus completely exposing the eyeball. In some operations the lid is shortened by the removal of skin flaps; in others, by fixation or suspension of the levator muscles of the eyelid; and in others, methods of fixation and shortening may be combined. The author points out which operations are best suited for certain types of ptosis. The operation preferred was devised by Motais in 1897 and consists of the transference of a longitudinal flap of the superior rectus muscle into the integument of the eyelid. Marquez later modified this operation by substituting one-half of the tendon of the muscle for the muscle itself. This operation requires a great deal of skill and sometimes fails to accomplish its purpose.

To obviate the difficulties of technique in Motais' operation, the author has devised a procedure whereby the levator palpebrum muscle is sectioned and fixed to the superior rectus or the levator is merely fixed without being sectioned. The levator palpebrum muscle lies on the same vertical plane and just above the superior rectus; both are supplied by the third cranial nerve. The upper lid is retracted with a sharp one-prong retractor. A horizontal incision 1 cm. long and 7 mm. above the corneal margin is made on the sclera, a similar incision is made on the conjunctiva of the upper lid, and both are joined at the middle by a third vertical incision. When the lid is retracted upward and the eyeball downward the superior rectus is exposed. The tendon of the levator is then fixed near its insertion by strong sutures to the superior rectus as far back from its insertion as possible. After the tendons are firmly fixed the levator may or may not be cut.

The technique of the author's operation is much simpler than that of Motais. The strong active muscle (superior rectus) is not affected whereas in Motais' operation the tendon is divided. There is no danger that suture material will rub against the cornea and both tendons of the levator are preserved and functionate. In Motais' operation only

the inferior tendon is used. The two contra-indications to the author's operation are: (1) paralysis of both the superior rectus and the levator muscles, and (2) congenital absence of the levator.

PIO BLANCO.

**Scalinci, N.: The Medical Treatment of Incipient Cataract** (La cura medica della cataratta incipiente). *Riforma med.*, 1920, xxxvi, 854.

The author reviews the various medical treatments to restore the opaque lens to its normal transparency, especially the use of iodine preparations in cases of incipient cataract. Iodine is efficacious particularly in incipient so-called "senile" cataract which the author prefers to term "dyscrasic" or "diathetic" cataract because of the physiochemical constitution of the lens and the relation of this type of cataract to changes in the organic metabolism inducing acidosis. Local applications of iodine pass into the interior of the eye.

The author uses a solution of sodium or potassium iodide to bathe the eye or for subconjunctival injections.

The type of cataract which is treated best by local applications of iodine is the primary cataract, especially that of the dyscrasic or diathetic type. The best results are obtained when the change in the lens is at its beginning. Certain diathetic cataracts, more especially those associated with glycosuria and more or less marked variation in refraction, are treated very advantageously with iodine. The lenticular opacity is attenuated even if it does not disappear.

The results reported by the majority of those who have carried out systematic iodine treatments in cases in which the vision varied from  $\frac{1}{6}$  to  $\frac{1}{8}$  showed an improvement up to  $\frac{3}{8}$  after several months of treatment.

The author draws attention to the necessity for supervising the patient's general condition as sometimes an underlying cause for the ocular lesion will be found in a disturbance of the general system. In this regard opotherapy has given results which are worthy of consideration. W. A. BRENNAN.

**Carreras: A Rare Form of Cataract from Contusion** (Una forma de catarata traumática por contusión). *Med. Ibera*, 1921, xiv, 39.

Carreras presents a rare case of contusion cataract simulating in appearance a bluish-white cyst of the iris. This proved to be a cystic swelling of the lens substance through a small tear in the lens capsule.

Its formation was due to the fact that the traumatic iritis and torn lens capsule effectively blocked off the remainder of the lens by adhesions. Thus



only the lens substance over the tear became hydrated and swollen. The correctness of the diagnosis was proved at operation.

F. P. SCHUSTER.

**Barraquer, I.: Cataract Extraction (Sobre facoerisis).**  
*Siglo med.*, 1920, lxviii, 21.

Barraquer describes a method of intra-capsular cataract extraction by means of a pneumatic suction-vibratory apparatus which grasps the anterior surface of the lens and vibrates it until the zonular fibers of the capsule are torn and then withdraws the lens.

He goes into the physics of tension and elasticity, showing that in senile cataract the zonular fibers are inelastic and when the capsule is made tense by the vacuum cup-like end of the instrument, short and rapid vibratory movements, produced and regulated by the pneumatic apparatus, tear the zonular fibers easily. The character, amount, and amplitude of the vibrations must be varied according to the type and age of the cataract, this being determined before the operation by studying the case under wide dilatation with strong illumination and a binocular loupes. The stages in the operation are described as follows:

After the usual preparation and with maximum dilatation, an incision involving two-fifths of the corneal circumference is made. This incision comes out somewhat in the sclera so that as large a conjunctival flap as possible is made. Following a Hess peripheral iridectomy, the vacuum-cup end of the apparatus described is slipped gently into the anterior chamber, behind the iris into the posterior chamber, and onto the middle of the anterior surface of the lens. Suction is then begun. The capsule being now in the grasp of the suction cup, the zonular fibers are thus made tense and are ruptured as the instrument is vibrated. The lens follows the gentle withdrawal of the instrument. The usual toilet of the wound is then carried out.

S. A. SCHUSTER.

**Walker, C. B.: Nasolachrymal Surgery in Ophthalmological Perspective.** *Arch. Ophthalm.*, 1920, xlix, 585.

Walker predicts that the formation of a nasolachrymal fistula will become the operation of election for a definite group of cases because it may be done without ether, without pain, and without an external incision, while the possibilities of functional result are equal or superior to those of sac extirpation.

The principle of fistulization is the same as in other regions of the head. Closure of the fistula must be prevented by making a simple circular opening with a spherical burr.

A very perfect anæsthesia may be obtained by applying cocaine-mud to the nasal wall opposite the sphenopalatine ganglion and at the anterior extremity of the cribriform plate.

Among cases recently reported the operation was successful in about 80 per cent and a failure in 10 per cent.

Cases of dacryocystitis fall into two groups, acute and chronic. In the acute phlegmonous type, in which external incision is necessary, an opening into the nose is made through the incision with a chisel, punch, or burr, and enlarged to its maximum size. A probe is then passed into the sac and the portion corresponding to the central portion of the bony opening is excised. Following this excision, a small gutta-percha cigarette drain is pushed into the nose through the sac to insure drainage, and the external wound is closed.

Chronic cases are approached intranasally by uncapping the lachrymal sac immediately in front of the attachment of the middle turbinate, then pushing the sac into the nasal chamber by means of a probe pushed through the uncut puncture, and excising as much of the tent thus produced as possible.

For the operation described Walker has devised a special chisel and a spherical burr with a guard.

Chronic catarrh, ethmoiditis, and catarrhal deafness are the chief complications and raise the percentage of operative failures because in these conditions keloid-like, raised scar tissue tends to form about the opening.

From observations of the process of healing by means of the nasopharyngoscope, it does not seem that a plastic flap operation would necessarily be of much value in preserving the fistula.

F. P. SCHUSTER.

**Bookwalter, C. F.: Intranasal Dacryocystostomy.**  
*Arch. Ophthalm.*, 1920, xlix, 568.

Bookwalter describes his method with very clear illustrations. His conclusions are:

The results of the operation are ideal if the opening is made large with smooth edges and treatment is carefully carried out to prevent excessive granulation until healing is complete.

Suppuration is invariably relieved.

There is no tearing even if the canaliculi are in only fairly good condition.

It is much better not to slit the canaliculi.

The most unfavorable occurrence after operation would be the closure of the opening. Even when this happens, however, either a secondary intranasal operation or an external operation is possible.

Considering the structures involved in the operation, it is difficult to comprehend how a serious complication could arise.

T. D. ALLEN.

**Moodie, A. R.: Two Cases of Double Glioma Retinæ.** *Brit. M. J.*, 1920, ii, 856.

The first case was that of a healthy appearing child 12 months of age. Six months previously he became "different" and the mother noticed that he had a "glide." Two weeks before admission she observed a white speck in each pupil. There was concomitant convergent strabismus of the right eye.



Both anterior chambers were shallow. The right pupil was dilated and unequal and reacted slowly to light. In both eyes a whitish tumor was visible on oblique illumination. The eyes were removed under ether on consecutive days. Pathologic examination showed the growth to be a typical glioma retinae with well-developed rosettes.

The second case was that of a child 3 months of age. The mother had noticed that "both eyes were glassy" for five days before the patient's admission to the hospital. At examination, both anterior chambers were found to be shallow, and the pupils were dilated and inactive. A large whitish vascular tumor could be seen in each eye. Tension was increased in both eyes.

The operative treatment was the same in both of these cases. Microscopic examination showed the tumor in both eyes of each patient to be a glioma retinae with considerable necrosis. In general, the growth was sarcomatous with a perithelial arrangement of the cells.

The prognosis in this condition depends on early diagnosis and immediate surgical treatment. If the affected eye is removed before perforation has occurred the prognosis is fair, but in the absence of operation or the presence of recurrence it is practically hopeless. There was no sign of extra-ocular extension of the growth, and six months after the operation both children were entirely well.

MERLE R. HOON.

**Herbert, H.: Small-Flap Sclerotomy (Rectangular Flap Sclerotomy).** *Brit. J. Ophthalm.*, 1920, iv, 550.

Herbert discusses the factors which cause permanent increased tension in glaucoma and the manner in which these are overcome by operative procedures. He speaks of the anatomy of the scar in operations on the iris and following the small-flap sclerotomy. He mentions particularly which kinds of glaucoma are most amenable to sclerotomy—those in which the tension is not very high and those in which a moderately high tension has not persisted for a long time. He urges the use of miotics for several weeks preceding the operation if the tension is above 40.

T. D. ALLEN.

**Vail, D. T.: Detachment of the Retina.** *Arch. Ophthalm.*, 1920, xlix, 553.

Vail states again a theory of his own regarding the etiology of detachment of the retina which he published first in 1912 and continues to hold. Statistics in Wood's encyclopedia show that myopia was the apparent cause of detachment of the retina in less than 50 per cent of 300 cases. Moreover, in many cases of myopia in which there are large sclerotic walls detachment of the retina does not occur, whereas in many cases of hyperopia in which the eyes are small it does occur.

As regards trauma as a cause, Vail mentions the fact that detachment of the retina follows severe intra-ocular trauma such as that associated with large vitreous loss in cataract extractions in less than

5 per cent of cases. He quotes from his previous paper his theory that there is a paralysis of the secretory function of the ciliary processes which leads to a reduction in the tension because the watery elements find ready egress. The withdrawal of normal tension causes a passive hyperemia of the blood vessels of the choroid and allows diapedesis and transudation. As the vitreous loses its watery condition it contracts, thus drawing upon the retina, and the transudation beneath the retina pushes upon it and causes retinal detachment. This is a combination of the well-known contraction theory and the diffusion theory.

As a possible cause of paralysis of the secretion of the aqueous, the author mentions anterior choroiditis and gives facts supporting this view. He discusses clearly the mechanism of aqueous secretion and shows how this agrees with his own ideas. He suggests the use of pilocarpine to promote the flow of aqueous and states that possibly there is a relationship between its action and that of the normal hormone producing the same result. T. D. ALLEN.

**Thomson, E. S.: Further Experiences with Trephining and Aspiration in Retinal Detachment.** *Arch. Ophthalm.*, 1920, xlix, 563.

Thomson gives the history and results in 7 cases of retinal detachment treated successfully by trephination and aspiration. These were the only successful cases among 75 treated in this manner. The detachment dated from a few days to seven months. In 2 cases the trephining was done first and the aspiration ten days later; in the others the two operations were performed at the same time.

A large conjunctival flap was dissected and a 2-mm. trephine was passed through the sclera as far back as possible over the area of detachment. With an electric ophthalmoscope, the needle of a syringe was introduced through this trephine opening, well back into the middle of the area of detachment, and all of the fluid beneath this area was withdrawn. If the fluid is not entirely withdrawn the operation is almost sure to be a failure.

An interesting observation was that the retina does not lose its function as rapidly as has been supposed. In the case in which the detachment had been present for seven months vision was completely regained although a blur remained in the field for several months after the operation. Thomson states that an immediate increase in function is noticed when the retina is replaced, providing perception of light in the detached retina had not been lost.

The larger the amount of fluid, the more slender the chances of success. Marked vitreous opacities are a distinct disadvantage. The tension does not remain permanently lowered after the operation but returns to normal after a few weeks. Infection at the site does not occur as when trephining is done at the limbus, probably because of the greater thickness of the conjunctival flap. If the retina is disposed to adhere it is a mistake to overdo the period of rest in bed; ten days is ample. T. D. ALLEN.



## EAR

**Friel, A. R.: Zinc Ionization in the Treatment of Local Sepsis.** *Med. Press*, 1920, n. s. cx, 431.

The author describes certain experiments which show the reasonableness of treating local sepsis by zinc ionization, enumerates the principal conditions which must be fulfilled in order to obtain successful results, and considers the position zinc ionization may occupy among the various methods of treating local sepsis.

Zinc ionization causes the coagulation of albuminous bacterial and tissue cells, and hence their death. This action depends upon the fact that when a salt is dissolved in water it is partly split up into ions which are the electrically charged basic and acid radicals. The basic radicals, which include all metals, are positively charged and the acid radicals, such as chlorine, iodine, salicyl, sulphuric, nitric, etc., are negatively charged. If two wires, one connected to the positive terminal and the other to the negative terminal of a galvanic cell, are dipped into the solution, the electric current from the cell moves the positive ions, such as zinc, silver, and copper, toward the wire connected to the negative pole, and moves the negative ions, such as chlorine, salicyl, etc., toward the wire connected with the positive pole.

The quality of response of living tissues to a stimulus depends upon the size of the dose. This is true also of zinc ionization and can be shown by ionizing an area of healthy skin. It will be found that a short ionization with a weak current will result in hyperemia, while a long application will result in necrosis.

The septic areas treated in practice may be divided into two types as regards the structure of the surface affected: (1) those in which the sepsis involves the skin and mucous membrane, and (2) those in which it is formed of tissue such as granulation tissue covering an ulcer or a pyogenic membrane forming the wall of an abscess. If the area to be ionized consists of skin or mucous membrane, care is necessary, whatever ion is used, to see that the dose is moderate as otherwise necrosis will result. The most usual position in which this most undesirable complication occurs is not in the area treated, but at the point where the indifferent electrode is applied to complete the circuit.

The effect of zinc is to destroy by coagulation, but when other ions such as sodium, hydrogen, hydroxyl, and salicyl, enter the skin in large quantity they will so alter the constitution of the cells as to cause their death. To prevent this, the indifferent electrode should be made as large as possible so that the current will be diffused over a large area.

In ionizing an abscess cavity or an ulcer the aim is to coagulate a layer over the whole surface and thereby render the ulcer or abscess sterile.

As to the dose necessary to sterilize a cavity or ulcer, the author states that the following have been found appropriate: middle ear, 3 ma., six minutes;

maxillary antrum, 20 ma., ten minutes; sphenoidal sinus, 7 ma., ten minutes; and frontal sinus, 10 ma., ten minutes.

There are two methods of determining the suitable dose. One, the empirical, consists in giving doses in a series of cases until it is discovered which amount gives the best clinical result. The other method, which is more accurate, consists in giving a dose with a definite immediate object, and when this object is attained, e.g., the sterilization of a surface, observing whether this sterilization is attended by the clinical results desired, namely, cessation of suppuration in a septic case followed by rapid repair.

In treating a septic cavity with irregular prolongations in the soft parts an equal dose of electricity must be delivered to each square centimeter of surface. To make this possible the prolongations and the central cavity must be converted into one large cavity or a wire suitably protected from contact with the tissues must be introduced into each prolongation.

Ionization is not strictly a method of treating disease, but a method of treating one of the factors of disease—septic infection. It has its definite place, and when the conditions for its application are present and it is applied with care and thoroughness, the results are excellent.

O. M. RORT.

**Baylor, J. W.: Restoration of Hearing in a Case of Gunshot Injury of the Eustachian Tubes.** *Bull. Johns Hopkins Hospital*, 1921, xxxi, 454.

Many of the technical difficulties of an examination of the ear, nose, and throat have been removed by the introduction of electrically lighted instruments. The nasopharyngoscope is especially valuable for the diagnosis of infections of the posterior ethmoidal and sphenoidal sinuses and for inspection and treatment of the eustachian tubes. Baylor does not consider the use of the nasopharyngoscope essential for the diagnosis and treatment of the majority of cases, however, as it is only by constant practice that sufficient skill is acquired to use it to advantage in cases which could not be treated by the ordinary methods.

For the past five years Baylor has used a nasopharyngoscope in the examination of all nose and throat cases and in the treatment of all eustachian-tube conditions. To this fact he ascribes the successful outcome in the case of one of his patients, aged 28, white, who was admitted to the Johns Hopkins Hospital February 20, 1920, complaining of deafness in both ears due to a gunshot wound received two years previously. The bullet from a 38-caliber pistol had entered the right side of the face 1 cm. in front of the tragus at the lower border of the zygoma and had passed downward at an angle of about 35 degrees. A temporary facial palsy and a subjective hemi-anesthesia on the right side developed. Immediately after the accident the patient was confined to bed in a hospital for three weeks. No attempt was made to remove the bullet. Hearing was subjectively normal during



this period. A short time later some impairment of hearing in the right ear was noted, and in six or seven months this had progressed to almost complete deafness. A discharge from the left ear had persisted for two or three months. This did not appear until four weeks after the injury and was not associated with earache. Hearing gradually became impaired on this side also, but to a less degree than on the right. On the patient's admission to the hospital there was no discharge from either ear. The drums were retracted and thickened.

On February 24 the patient was anesthetized and placed in the Trendelenburg position. The soft palate was retracted by means of small rubber catheters passed through each nostril and brought out through the mouth. The tissues of the nasopharynx were infiltrated with procaine and adrenalin to control bleeding partially and to diminish the reflexes which invariably occur during operative procedures in the nasopharynx.

Even under direct vision the orifices of the eustachian tubes could not be recognized. The scar tissue was removed by sharp dissection and with sharp nasal rongeurs. The bleeding was controlled whenever possible by the introduction of catgut sutures. The nasopharynx was not packed.

The postoperative course was uneventful until the fifth day when bronchopneumonia developed on the right side. The patient was therefore transferred to the medical service. There he remained until March 28, at which time he had completely recovered. Nothing was done to the nasopharynx during this period except that it was frequently irrigated with sterile normal salt solution followed by the introduction of sterile albolene into each nostril. During the next three months about three hours a week were devoted to the localization and dilatation of the eustachian tubes. After three months of treatment the hearing in the right ear still remained slightly impaired and bone conduction was a little better than air conduction. With this improvement in hearing there was no appreciable change in the appearance of the tympanic membrane on either side. It seemed possible to the author that the scar tissue might ultimately contract and again produce stenosis, but he believed that subsequent treatments would not be more difficult than in ordinary strictures of the eustachian tube. The point emphasized in this article is that it would have been impossible to benefit this patient in any way without the use of the electrically lighted nasopharyngoscope.

G. E. BEILBY.



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# INTERNATIONAL ABSTRACT OF SURGERY

MAY, 1921

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Farr, C. E.: Picric Acid in Operative Surgery.** *Ann. Surg.*, 1921, lxxiii, 13.

With the aid of Spencer and Kingery of the New York Hospital, Farr carried on a series of experiments on guinea pigs to determine the effect of picric acid on the peritoneum.

Four healthy animals received intraperitoneally hypodermic doses of picric acid in watery solution ranging from 1 to 2 c.cm. of 1 per cent solution and from 0.05 to 1 c.cm. of 5 per cent solution. No ill effects except slight shock due to the peritoneal irritation were noted.

At the expiration of six weeks laparotomies were performed under anæsthesia upon these four animals. No adhesions were found and all the organs appeared perfectly normal. The preparation for the operations consisted merely of the application of 5 per cent alcoholic picric acid solution to the skin. The operator's hands were not washed, but were dipped in the picric solution. The intestines were allowed to protrude freely onto the abdominal wall and were subjected to rough handling with dry gauze. The wounds were then sutured.

All four guinea pigs made an excellent recovery. One died at the end of six weeks from abortion. All were subjected to postmortem examination; nothing abnormal was found. The conclusion seemed justified that, at least in guinea pigs, picric acid in rather large amounts does not tend to cause peritoneal adhesions.

The penetrating power of picric acid is practically that of iodine. Skin scrapings were made after the use of the 5 per cent picric acid solution in over thirty operative wounds. Of the 27 cases in which the final result was obtained 16 were reported sterile throughout, while 11 gave bacterial growths of various kinds as follows: staphylococcus albus, 5; staphylococcus albus and diphtheroids, 1; bacillus subtilis, 3; a gram-positive bacillus, 2.

In the author's opinion the chief value of picric acid lies, not in its germicidal power, but in its

tanning qualities. He believes the bacteria are mechanically caught and held in the thick pellicle of tanned skin which develops after the use of the acid. This holds them enmeshed until the wound is sealed. The condition of the lips of the wound at the end of operation is markedly different from that noted after the use of iodine. Iodine is largely gone, into the wound and onto the towels, sponges, etc., but practically all of the picric acid remains, however protracted the operation.

Picric acid is ideal as a skin application preceding operation in that it never irritates and it remains in the skin for a long period of time. Its only drawback is its rather startling color which may annoy sensitive patients when exposed surfaces are stained. Farr's results compare favorably with those obtained with the older methods of skin preparation.

G. W. HOCHREIN.

**Gretsel: Metal Foil in Operative Surgery** (Metallfolien in der praktischen Chirurgie). *Deutsche med. Wchnschr.*, 1920, xlv, 1391.

The metal foils — tinfoil and the cheaper aluminum foil — are of value to cover wound surfaces. From raw wounds they can be easily and painlessly lifted off as granulation tissue does not adhere to them. In cases of profuse discharge they rupture so that the dressings lying above are able to absorb the discharge and do not adhere to the wound. Soiling of the wound by the surrounding skin is impossible because the overlapping foil adheres to the skin. The wound surface appears fresh and shiny.

Before it is applied, the foil is dipped in 1 per cent saproten or lysol solution and rinsed with normal salt solution. The advantages of its use are: painless changing of dressings even in the most sensitive regions; shortening of the healing time by one-quarter to one-third; and minimal scar formation because the irritation of the wound is slight. Free transplants and flaps healed remarkably well. Foil drains are well adapted to the treatment of deep wounds as they produce no pressure. In abdominal



surgery zinc foil has proved of value to cover the operative field. Being a slow conductor of heat, it prevents the cooling of the abdominal cavity and keeps it from drying out. It reflects the light well and consequently the operative field is better illuminated.

WORTMANN (Z).

**Spaeth, E. B.: The Correction of Scar Tissue Deformities by Epithelial Grafts: Report of Five Cases.** *Arch. Surg.*, 1921, ii, 176.

Spaeth reports 5 cases in which scar tissue deformities were corrected by means of epithelial grafts. The first patient was a male, aged 23, who was admitted to the hospital April 18, 1920. The left eye showed a complete ectropion of the upper lid from loss of all tissue due to a third-degree burn causing scar-tissue contraction. The palpebral conjunctiva was deeply ulcerated and in addition there was ulceration of the corneal conjunctiva, i.e., keratitis and lagophthalmia. The third-degree burn was due to the explosion of a gasoline torch which occurred four months previously. Vision in the right eye was 20/200, amblyopia ex anopsia, and in the left eye, 20/40.

Under local anesthesia induced with procaine 0.5 per cent and epinephrin 1:25,000, an incision was made in the upper lid, and the lid margin allowed to drop to its normal level. The edges of the incision were undermined with great care to prevent any destruction of the remaining fibers of the levator palpebrae and its nerve supply. The ulcerated area in the palpebral conjunctiva was completely excised and a very thin and small pedicled flap from the edge of the incision was turned in to cover the raw area. A Thiersch graft was then cut from the inner aspect of the arm under procaine anesthesia and wrapped with its epidermal surface inside around a gutta-percha mold. The gutta-percha had been sterilized by boiling and was softened with hot water in order to mold it to fit the cavity formed by the dissection. The mold with the graft was then sutured in place and the operative field dressed with warm salt solution for the first twenty-four hours. Thereafter dry dressings were used. At the end of six days the sutures were removed, the line of incision was reopened, the mold was removed, and the pedicle of the flap to the palpebral conjunctiva was resected. Immediately following the removal of the mold the condition was overcorrected at least 50 per cent. Massage and the contraction which always occurs in Thiersch graft outlays soon brought the lid to the normal size and position. One month later, two small free grafts about  $1\frac{1}{2}$  in. in length and  $\frac{1}{4}$  in. in width were excised from the occipital scalp and placed in the supra-orbital region to replace the loss of the eyebrow. A very satisfactory result was obtained.

The second patient was a male, aged 20. There was a marked deformity and a decrease in the size of the concha due to scar-tissue contraction with loss of substance. The eye condition was a bilateral ectropion of both the upper and lower lids. There

was also a defect of the skin over the bridge of the nose. The cause was a third-degree burn due to the explosion of a phosphorus grenade.

A pedicled flap from the forehead was used to repair the deformed skin over the bridge of the nose. The ear was restored by means of pedicled flaps from the neck and cartilage implants from the seventh costal cartilage. The eye condition was treated as in Case 1. The result was satisfactory.

The third patient was a male, aged 21. Examination disclosed traumatic enucleation of the left eye with almost entire absence of a conjunctival sac which had been replaced by an unhealthy mass of granulations. There was some entropion of both the upper and lower lids. The granulations and superficial infection cleared up under treatment with silver nitrate and dressings of surgical solution of chlorinated soda. Under general anesthesia a deep incision was made posterior to the upper and lower lids following the normal conjunctival cul-de-sac. A sterile gutta-percha mold was fitted and wrapped with a Thiersch graft. The entire cavity of the socket was freely curetted, and the mold with the graft placed in position. The lid margins were freshened by excision of a very thin line of tissue and were then sutured together. Six days later the mold was removed and a glass ocular prosthesis was inserted.

The fourth patient, a male aged 27, showed a traumatic enucleation of the right eye with loss of bony tissue from the outer inferior edge of the supra-orbital area. The bony defect was 1 in. long and  $\frac{1}{2}$  in. wide. The skin over this area was adherent to the site of the bony defect, drawing the upper lid upward and outward. The upper lid was fixed, making all motion impossible and preventing the retention within the socket of an ocular prosthesis. Under procaine and epinephrin anesthesia a skin incision was made below the supra-orbital margin, and by undercutting, complete release of the upper lid was obtained. A mold of sterile gutta-percha was fitted, wrapped with a Thiersch graft from the arm, and sutured into the cavity made by the dissection. The operation was satisfactory insofar as it furnished sufficient skin to relax the epidermal defect. One month later, under general anesthesia, the bony defect was corrected with a cartilage implant. The cartilage was obtained from the seventh costal cartilage and was cut slightly oversize. The bony defect was filled in and the skin applied smoothly. The lid was entirely relaxed. With the addition of a small canthoplasty which is to be performed at an early date, the socket will be in proper condition for the fitting of a glass eye.

The fifth patient, a male aged 19, showed a traumatic enucleation of the left eye with an ectropion and contraction of the upper left lid upward and outward. The cause of the deformity was a loss of soft tissue and a greatly contracted scar adherent to the outer edge of the supra-orbital region. Under procaine and epinephrin anesthesia a horizontal incision was made through the center of the scar. By undercutting, complete relaxation was obtained



above and below the incision. A sterile mold of gutta-percha was fitted slightly oversize, wrapped with a Thiersch graft, and sutured into the cavity. The result was entirely satisfactory.

The author emphasizes the fact that the cavity must be made much larger than might be thought necessary as it will undoubtedly shrink. All scar tissue must be released. In working on the lids, the undercutting should be close to the under-surface of the skin to save every fiber of muscle tissue possible. Spaeth found that from six to eight days is sufficiently long for the mold to remain in the cavity. If it is not removed by that time it is almost certain to break out through the line of sutures, and the result is a ragged, puckered, uneven Thiersch graft and skin junction. One half of 1 per cent procaine with epinephrin 1:25,000 is the anæsthetic of choice both for the dissection and for the cutting of the graft. Thiersch grafts should be cut as thin as possible.

G. W. HOCHREIN.

**Whitham, J. D.: Plastic Repair of Soft Tissue Injuries of the Face. *Mil. Surgeon*, 1921, xlviii, 65.**

The face is by far the most favorable part of the body for plastic operations because of its vascularity.

In the early treatment of face injuries the surgeon must be on the lookout for the following complications: hæmorrhage, cellulitis, œdema of the larynx, dysphagia, and lung infections. Painstaking removal of all dirt and foreign bodies by washing and the use of forceps is necessary, and whenever infection is present Dakin's solution should be employed. Primary suture is usually advisable except in extensive war wounds.

After wounds have healed over, ample time must elapse, especially in cases of war wounds, before the late and final operations are begun. During this period much can be accomplished by massage, i.e., punching, pinching, and rubbing the parts. Radiotherapy is useful to soften extensive scars. Operation should be postponed until scar contraction has ceased, the nutrition of the parts has improved sufficiently, and it is evident that no infection is latent in the wound.

Scars are usually treated by excision, the incisions being extended into healthy skin on either side. The author has found dermol a most satisfactory suture material. He uses interrupted stitches placed with ophthalmic needles. When there is no tension on the wound edges he removes half the stitches on the second day and the remainder on the fourth day.

Extensive scars of the face may be treated by excision and covering the denuded area with sliding flaps from adjacent areas or pedicled grafts from the skin. Large Krause-Wolf grafts may not take when used on the movable parts of the face, but can be applied to the forehead and nose. Depressed scars may be improved by careful excision, undercutting the skin edges, and turning into the depression small pedicled subcutaneous fat flaps obtained from the neighborhood of the wound.

Free fat is very useful in many cases of depressed scars. It is most readily obtained from the subcutaneous tissue of the abdomen.

Cartilage is sometimes of value in the obliteration of depressions in the face, especially about the forehead, the eyelids, the nose, and the malar and zygomatic regions.

There are three methods of reconstructing the nose: first, the Indian method, in which a flap is taken from the forehead and brought down on a pedicle; second, the French method, in which the loss is replaced by undercutting and sliding adjacent skin; and third, the Italian method, in which a flap is taken from some other part of the body.

The best method of performing a complete rhinoplasty is believed to be a modification of the Keegan operation which is performed as follows:

Three pieces of costal cartilage are obtained from the patient, one measuring about  $2\frac{1}{2}$  by  $\frac{1}{2}$  by  $\frac{3}{4}$  in., and two pieces each measuring about 1 by  $\frac{3}{4}$  by  $\frac{1}{4}$  in. These are implanted beneath the skin of the forehead and cheek. After six to eight weeks, if the cartilages have not undergone absorption, the rhinoplasty is performed. Quadrilateral flaps are cut on each side and above the nasal orifice. These are turned in with cartilages attached to form the supports, and the skin edges are sutured so that the lining is made complete. A large forehead flap is then cut exactly to pattern and brought down to form a covering for the nose. An extension must be made at the tip of this flap to form the new columna nasi. This is sutured to a corresponding flap which is cut on the upper lip and turned up to meet it. The forehead defect is then closed as far as possible by undercutting the scalp, suturing the edges, and stitching into place a tightly fitting Krause-Wolf graft. A good result depends on obtaining a good, non-shrinkable skin lining and on the formation of a solid tripod of cartilage for the support of the nose. Following the operation large rubber tubes are inserted into each nostril. These are replaced later by especially made intranasal conformers attached to an upper encapping dental splint. After four weeks the pedicled flap may be returned to the forehead, and after six weeks the retouching operations may be begun.

A completely destroyed eyelid is so difficult to restore satisfactorily that the long series of operations necessary is often not justifiable. Eyelids are best restored by means of temporal or supra-orbital flaps. These must be made over-large as the shrinkage is great.

Eyebrows have been successfully replaced by free grafts. The scalp just behind the mastoid is very suitable for this purpose. In certain cases the hairs of the uninjured eyebrow have been carefully combed into upper and lower halves, and one of these halves has been removed and sutured as a free graft to replace the lost eyebrow.

Before attempting the reconstruction of a lip it is essential that the bony substructure, if lost, should be replaced by prosthesis as it is only in this way that an



extreme degree of shrinkage and a very poor result can be avoided.

In repairing cheek defects the use of pedicled flaps is a last resort and necessary only in cases of extensive loss. In these cases, as in cases of eyelid or nose reconstruction, the provision of an adequate lining of skin or mucous membrane is of the greatest importance. This is best obtained by the inversion of neighboring skin.

MARGARET I. MALONEY.

### ANÆSTHESIA

**Gwathmey, J. T.: Synergistic Colonic Analgesia.**  
*J. Am. M. Ass.*, 1921, lxxvi, 222.

In 1913 Gwathmey presented in collaboration with Wallace the results of experiments on animals with regard to the colonic administration of oil and ether for the induction of anæsthesia. Since then he has introduced another element into colonic anæsthesia which will render expert supervision unnecessary. This element, which is being tested clinically at the Presbyterian Hospital, New York, is termed "synergistic analgesia." By "synergism" is meant the reciprocal augmentation of the action of one drug by that of another.

At the Presbyterian Hospital it has been definitely determined that the addition of a small amount of magnesium sulphate to the usual hypodermic of morphine increases the value of the hypodermic from 50 to 100 per cent. The author has converted colonic anæsthesia into synergistic colonic analgesia by taking advantage of this fact. In other words, he proposes to obtain complete brain block by using much smaller amounts of ether than were employed heretofore and adding to the effect of the ether the synergistic effects of the combined morphine and magnesium sulphate. A patient under synergistic colonic anæsthesia will not be in a third-stage anæsthesia, but will be unconscious. The danger of obstruction of the airway by the relaxed tongue will be eliminated, and as the patient will be separated from danger by the second and third stages of anæsthesia, expert supervision will be unnecessary.

The clinical results at the Presbyterian Hospital showed that:

1. General analgesia could not be obtained by means of morphine and magnesium sulphate alone.

2. With three hypodermic injections, each of  $\frac{1}{4}$  gr. of morphine and 2 c.cm. of magnesium sulphate, supplemented by nitrous oxide and oxygen—a much higher percentage of oxygen being used than usual—an analgesic state with unconsciousness and complete relaxation is secured which entirely eliminates the necessity for ether.

3. Morphine, whenever indicated, may be given in a 25 per cent sterilized solution of chemically pure magnesium sulphate. This procedure increases the value of the morphine from 50 to 100 per cent.

Three definite facts were established as a result of animal experiments and clinical observations:

1. When magnesium sulphate (from 1 to 2 c.cm.) is used with morphine (from  $\frac{1}{2}$  to  $\frac{3}{4}$  gr.) instead of plain water and is given by hypodermic injection, the value of the morphine is increased from 50 to 100 per cent. That is, one hypodermic injection will do the work of from two to four.

2. Magnesium sulphate (from 6 to 15 c.cm.) given by hypodermic injection two hours before an operation, followed by morphine sulphate (from  $\frac{1}{12}$  to  $\frac{3}{4}$  gr.) given hypodermically one hour before the operation, and supplemented by nitrous oxide and oxygen (the oxygen being employed in a much higher percentage than usual) gives a safer and better relaxation than when ether is used.

3. Analgesia with consciousness is induced oftener by colonic anæsthesia than by other methods of administering any of the general anæsthetics.

M. I. MALONEY.

**Crotti, A.: The Anæsthesia Problem in Goiter Surgery — General Considerations.** *Am. J. Surg.*, 1921, xxxv, Anæst. Supp., 2.

Crotti states that many surgeons believe that a well-handled general anæsthesia is less apt to be followed by severe consequences than local anæsthesia; that, in fact, during local anæsthesia the psychic emotions and shock may be just as marked as during general anæsthesia and the consequences may be equally disastrous. Certainly real harm may be done by the mental strain and physical suffering sustained by the patient during an operation performed while he is conscious. When a local anæsthetic is used the operation must be done very slowly, much time being lost in encouraging the patient; hence the probability of surgical shock is increased. Furthermore, a painless operation is not always so easily obtained and the results following local anæsthesia are certainly no better than those following general anæsthesia. For these reasons it is evident why many surgeons prefer general anæsthesia. The choice between the two forms, however, seems to be rather a matter of the personal equation than anything else.

The dangers connected with general anæsthesia may be eliminated to a great extent by certain rules. In order to prevent respiratory and cardiac collapse the anæsthetic used should be very pure and should be given slowly and with extreme care, the patient being allowed to inhale sufficient air or oxygen with it. Excitability should be decreased by a preliminary dose of morphine, or better, pantopon and scopolamine. Theoretically, the use of atropine would be ideal as this drug suppresses at the same time the risk of cardiac collapse. Unfortunately, however, a sufficient dose of atropine to be effective would be too toxic. In smaller doses atropine is of value to decrease the secretions of the buccopharynx and trachea.

In cases of large and old goiter, tracheal deformations, dyspnoea and spells of suffocation, chronic congestion of the entire respiratory tract, myocarditis and arrhythmia, general anæsthesia is contra-indi-



cated. For persons with exophthalmic goiter who are profoundly toxic and have functional insufficiency of the myocardium, kidneys, or liver any form of anæsthesia must be regarded as dangerous. When a patient with exophthalmic goiter is still a safe surgical risk, however, general anæsthesia carefully induced and carefully watched is the method of choice.

In goiter surgery the secret of success is to know how to proportion the surgical act to the patient's condition. Too often failures and misfortunes are charged to the anæsthetic when their sole cause was a lack of judgment and experience on the part of the surgeon and an injudiciously performed operation in which either the right thing was done at the wrong time or the wrong thing was done at the right time.

ISABELLA C. HERB.

**Blair, V. P.: The Anæsthesia Problem in Goiter Surgery from the Surgeon's Viewpoint.** *Am. J. Surg.*, 1921, xxxv, Anæst. Supp., 5.

In Blair's opinion the operator's temperament and technique have in general a much stronger bearing on his choice of anæsthetic than the chemical properties or physiologic reactions of the anæsthetic agents, and this holds true with regard to local anæsthesia as compared with general anæsthesia.

The similarity of results obtained by different men who, with large experience, restrict themselves to a certain type of anæsthesia does not mean that there can be no element in the particular case pertaining to the choice of the anæsthetic, but rather that the proper correlation of the anæsthetic with the technique is of vastly more importance than the type of anæsthetic agent employed. Unless he has been trained in a clinic where a definite plan has been perfected, the operator who is building up a thyroidectomy experience is not apt to feel that he will best conserve his patients' interests and his own energies by accepting any particular anæsthetic as routine until he has at least attempted to analyze the factors bearing upon the use of each. His conclusions will be influenced by his temperament, operative skill, environment, and preliminary training. It is probable that the same differences of opinion will prevail among the future authorities as among the present leaders unless a predominating factor, which we do not yet recognize as such, imperatively demands the unification of plan.

In spite of the special factors entering into thyroidectomy Blair concludes that, on the whole, the outcome must be largely influenced by the same factors which control the outcome in other types of operation. In his own city, at least, the deaths occurring during nitrous oxide-oxygen anæsthesia have been in such preponderance over those occurring under ether that he is prejudiced in favor of ether. His experience causes him to use local anæsthesia on goiter patients who are very ill either from intoxication or degeneration in essential organs. For simple cases and cases of mild intoxication he uses ether.

ISABELLA C. HERB.

**Allen, C. W.: Thyroidectomy under Local Anæsthesia.** *Am. J. Surg.*, 1921, xxxv, Anæst. Supp., 12.

Allen prefers local anæsthesia in all cases of the colloid and exophthalmic types of goiter. Large size of the goiter is not a contra-indication for if the case can be operated upon at all, it can be operated upon more safely under local anæsthesia. The infiltration technique is described as follows:

The patient is prepared with a light meal and a hypodermic of  $\frac{1}{4}$  gr. of morphine and  $\frac{1}{150}$  gr. of scopolamine one hour beforehand. A small intradermal wheal is then produced with a fine needle in the center of the neck in the center of the gland. For the induction of the deeper anæsthesia a syringe of a capacity of 5 c.cm. and a fine needle about 4 in. long with a short, sharply beveled point are used. The needle is inserted through the intradermal wheal and passed down to the deep fascia with the object of getting beneath the platysma muscle, the known position of the branches of the superficialis colli nerve. In this position its point is turned outward and slightly upward toward the superior pole of the thyroid gland and then slowly passed outward, the anæsthetic solution being injected as it is advanced.

The amount of the anæsthetic solution used depends upon the size of the gland. If the thyroid is as large as a small grapefruit, 5 c.cm. will be sufficient. If it is necessary to refill the syringe it is detached, the needle being left *in situ* so that an additional puncture is avoided. After one side of the neck has been injected the needle is withdrawn sufficiently to direct its point in the opposite direction and the other side of the neck is similarly injected. The long needle is then withdrawn and a small syringe and a fine needle are used to produce an intradermal line of anæsthesia along the proposed course of the skin incision. The deep injection is made first so that it has time to diffuse while the skin is being injected.

The tissues are incised the entire length of the field down through the platysma, but if preferred, the skin only may be divided and dissected up the platysma and deep fascia being divided on a different level. The first incision having been made down to the sternohyoid muscle, the superficial tissues are dissected up so that the field is exposed. The long needle and large syringe are now used again. The needle is passed down under the sternohyoid and sternothyroid muscles into the tissues above the superior pole in the direction from which come the fibers from the descendens hypoglossi. The anæsthetic is injected continuously as the needle is being gently and gradually advanced until a point is reached about  $\frac{1}{2}$  in. above the superior pole. At this point about 5 c.cm. are injected on each side.

In making injections in the direction of any large vessel the needle should always be inserted very gently and should be stopped if any resistance is felt. It is well also to aspirate at short intervals by withdrawing the piston of the syringe slightly; if a vessel has been entered blood will appear in the



syringe. This accident will not occur if the technique is correct. If it does occur, no damage will result if the needle is of the proper kind and has been handled gently. The muscles overlying the gland are now separated in the midline and are either retracted or divided as necessary, the surface of the gland being freely exposed.

The outer margin of the gland is raised from its bed by slight traction and rolled toward the midline. A finger is then insinuated beneath its margin to aid further in its elevation. This finger feels out the carotid vessels which lie beneath so that they are recognized below and on the outer side of the finger tip. In this position the long needle is passed over the tip of the finger and between it and the gland, and the tissues under the gland are lightly injected. The opposite side is treated in the same way. An additional injection is then made on each side of the

trachea just above the isthmus to reach the nerve branches coming forward in contact with the cricoid cartilage. If the gland is very large, additional injections may be necessary just below the inferior pole.

An essential in this operation as in all others done under local anæsthesia is a thorough knowledge of the nerve supply. The solution used to induce anæsthesia is of secondary consequence provided it is an efficient and safe local anæsthetic. Allen prefers 0.5 per cent novocaine in 0.4 per cent salt solution, with about 5 drops of adrenalin solution (1:1,000) to each ounce provided not over 4 oz. are used. If more is necessary, the quantity of adrenalin should be decreased. The cardiovascular stimulation of adrenalin is dangerous in exophthalmic goiter and should be reduced to the minimum.

ISABELLA C. HERB.

## SURGERY OF THE HEAD AND NECK

### HEAD

**Hanson, A. M.:** *A Report of a Series of 44 Cranio-Cerebral Injuries Operated upon in the Zone of Advance with the A. E. F. Mil. Surgeon, 1921, xlviii, 30.*

In every case of head injury the head was completely shaved. Two skiagraphs were then taken. An attempt was made to note the depth of an intracranial foreign body. The patient was given  $\frac{3}{8}$  gr. of morphine hypodermically. At the operating table the scalp was washed with soap and sterile water and carefully wiped off with alcohol.

Under local anæsthesia a suitable incision was made. In cases requiring suboccipital exploration or decompression the wound was excised down to the skull. Three incisions were then made to the excised wound in such a way as to facilitate the approximation of all edges. Rat-tooth forceps were placed in the edges of the cut superficial fascia at intervals of  $\frac{1}{4}$  in. and bound together by a strip of sterile gauze passed through the handles and fastened to a sterile sheet. In this way they were made to serve also as retractors. Trepanation of the skull followed with removal of a block of bone, triangular, quadrangular, or pentagonal, as the case might be. Three, four, or five holes were then drilled and cutting was done between them with a DeVilbiss forceps.

In the frontal and occipital regions where the skull is thick and dense and the defect was small, the opening in the skull was enlarged by the use of rongeurs in order to leave as small a defect as possible. The wound was then thoroughly swabbed with alcohol, the surgeon's gloves were changed, and sterile towels were fastened to the lower layer of the scalp with a few linen sutures. This having been done, a soft-nosed rubber catheter was passed through the laceration in the dura to locate pieces of in-driven bone and other foreign bodies. These

were removed with a delicate forceps. To remove pulped brain and débris the patient was requested to cough and the track was irrigated through the catheter with warm sterile saline solution as the foreign bodies were located. When the track was clean, a small amount of pure ethyl alcohol was injected on the withdrawal of the catheter. The dura was left open so that a decompression opening remained. The wound was then again swabbed out with alcohol and the scalp closed in layers.

When the shell fragment or bullet was near the surface opposite the wound of entrance, either occipital or frontal, or in the opposite hemisphere, an osteoplastic flap was turned down and a search was made for the foreign body with a telephone probe, with care to avoid the live areas. This telephone probe consisted of an ordinary telephone receiver with a cartridge shell attached to one wire and a 14-in. silver probe attached to the other wire. With care that the metallic cartridge shell did not come in contact with metal fillings in the teeth, it was placed in the patient's mouth. When the probe came in contact with a bullet with its casing intact or a fragment of steel a sound like a faint sputtering of overcharged electricity was elicited. When the dura was turned down over a portion of brain with a foreign body near the surface, œdema was always found, and sometimes subdural hæmorrhage or clot. Cerebral and meningeal vessels which were bleeding were ligated with fine silk. When infection was present and the meninges were greatly thickened, meningeal hæmorrhage was controlled by applying small silver clips. On the completion of the operation it was sometimes found that the œdematous brain, which extruded as soon as the dura was opened, rendered suture of the dura impossible. In these cases the bone flap was replaced and the scalp sutured in layers. When a cerebral hernia was present it was cut away during the first stage of the operation.



Injuries to the sinuses were plugged with muscle graft, if small, and covered with a piece of pericranium turned inside out, if large. In this manner the hemorrhage was controlled completely if the graft was gently kept in place for a minute or two.

The author gives a brief history of each of the 44 cases observed. His conclusions are:

1. All head injuries should be considered serious until proved otherwise by exposing the skull.

2. The first stage of the operation is the dirty stage, and all instruments used about a soiled wound and in performing trepanation of the skull should be discarded, the wound wiped out with alcohol, and the operator's gloves changed.

3. The track should be painstakingly cleansed and all foreign bodies removed if possible. Pure ethyl alcohol in the track does not increase edema, sterilizes the track as effectively as any other antiseptic, and leaves no residue.

4. The dura should not be closed as an opening should be left on account of the edema which is always present and to serve as an outlet for any possible subsequent infection.

5. Osteoplastic flaps turned down counter to the wound of entrance for the removal of a foreign body are justifiable, even though the dura cannot be closed because of edema.

6. Débridement of the skull (simply enlarging the hole in the skull with rongeurs) should be done in the frontal or suboccipital regions where the bone is thick and it is desired that the skull defect shall be minimal. If the injury is situated over a sinus, however, trepanation should always be done so as to expose the sinus completely.

7. In large egg-shell fractures of the skull an effort should be made to cleanse the track in the brain, if any. Extradural bone fragments, however, should not be removed or disturbed. A conservative débridement of the soft parts should be done and followed by suture. If infection is present a small rubber drain should be used.

M. I. MALONEY.

**Thoma, K. H.: A Contribution to the Knowledge of Cysts of the Jaws.** *Boston M. & S. J.*, 1920, clxxxiii, 730.

Thoma reports that two types of cysts of the jaws may be distinguished, one originating from the dental follicle and called "follicular cysts" and the other resulting from an infection at the root end of a tooth and called "radicular cysts."

The follicular cyst is caused by abnormal development of a tooth follicle during the developmental stage of the tooth. It occurs most frequently in connection with a misplaced unerupted or supernumerary tooth. It may develop from the enamel organ when a tooth is not formed. If the cyst contains a tooth it is called a "dentigerous cyst."

The radicular cyst is of inflammatory infectious origin and forms at the apex of a tooth.

M. N. FEDERSPIEL.

## NECK

**Pemberton, J. De J.: The Surgery of Substernal and Intrathoracic Goiters.** *Arch. Surg.*, 1921, ii, 1.

The author distinguishes substernal and intrathoracic goiters, applying the latter term only to thyroid growths of which the major portion lies within the thoracic cavity. All other tumors of the thyroid whose inferior projection extends from 1.25 cm. to 7.5 cm. below the sternum and is equivalent to less than half the growth are classed as substernal goiters.

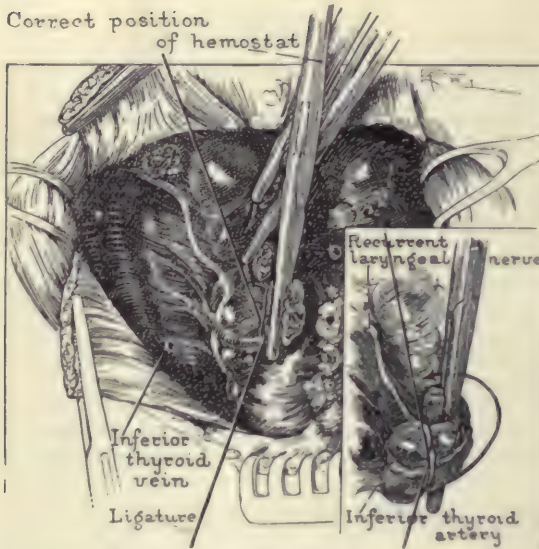
Several causative factors in the production of intrathoracic and substernal goiter are discussed; namely, the pressure exerted by the depressor muscles of the hyoid and the sternomastoid, the manner of attachment of the inferior thyroid artery, a relatively loose attachment of the inferior half of the lobe, and the influence of thoracic movement in breathing. Downward through the intrathoracic inlet is the path of least resistance for the enlargement of a tumor originating in the lower pole of the lobe. The intrathoracic portion may be firmly fixed so that the movement of the cervical portion with the trachea may result in almost complete separation of the two parts.

Between January 1, 1917, and June 6, 1920, 4,006 thyroidectomies were performed in the Mayo Clinic for simple colloid and adenomatous goiters. Thirteen and one-half per cent of these were substernal and 0.6 per cent were classified as intrathoracic. The average duration of the goiter was 18.5 years and the average age of the patients, 46.11 years. Sex does not play an important rôle in the incidence of substernal goiter, although between the fifteenth and twenty-fifth years of age males are affected relatively more frequently than females. Malignant disease of the thyroid occurred in only 7 cases. The symptoms from which the patients sought relief varied from deformity of the neck to symptoms associated with hyperthyroidism or pressure of the tumor on the neighboring structures. The intensity of the symptoms due to substernal goiter depends on the localization as well as the size of the tumor. Pain is practically never present except when the tumor is malignant.

The diagnosis can usually be made by palpation. In some cases percussion may reveal dullness. As the shadow of a small retrosternal goiter may not be discerned in the roentgenogram, the final pre-operative diagnosis rests on the fluoroscopic examination.

Local anæsthesia should be used for all patients with large substernal goiters as well as those with obstructive dyspnoea. The operative technique described by Judd was used in the cases reviewed and is well illustrated in this article by drawings. Tracheal obstruction may occur during the operation or after an interval of several hours. Postoperative hæmorrhage, which is not an uncommon complication after thyroidectomy, usually occurs early within the first six hours. Paralysis of the vocal cords occurs in only a small percentage of cases. Temporary tetany developed in only 6 cases. Direct injury to





Diagrams to show how recurrent laryngeal nerve may be caught in the ligature by twisting the forceps.

the recurrent laryngeal nerve may be due to stretching or severing the nerve, or to crushing or compressing it with the forceps or in the suture (see figure). Indirect injury may be due to swelling or scarring of adjacent tissues. Air embolism is emphasized as a possible complication, but no cases of this type were seen in this series.

G. S. FOULDS.

**Rendleman, W. H., and Marker, J. I.: A Case of Tuberculosis Primary in the Thyroid.** *J. Am. M. Ass.*, 1921, lxxvi, 306.

In reporting this case as tuberculosis primary in the thyroid the authors are aware that their diagnosis will be doubted. No previous diagnosis of tuberculosis had been made in this case even though the early history was suspicious.

The authors' patient, a girl of 22, consulted them January 19, 1920, because of enlargement of the neck. Her history was negative except that she had had several attacks of tonsillitis and a discharging sinus had formed over the thyroid during her tenth year of age and healed after draining for a year. About two years later the sinus again discharged and continued to do so until she was 15, when it again healed and gave no further trouble. The present

illness began with gradual enlargement of the thyroid about nine months before the authors saw the patient. There were no symptoms of hypothyroidism or hyperthyroidism, and the condition appeared to be a simple goiter. There was slight difficulty in swallowing on account of the pressure of the tumor. The patient was troubled with frequency of urination during the day and urinated twice each night. There was no periodic change in the thyroid with the menstrual period.

On physical examination no tremors and no exophthalmos or other eye signs of hyperthyroid function were noted. The urine was negative as regards sugar, albumin, and urobilinogen. The Wassermann test also was negative. A basal metabolism test, made later at the Mayo Clinic, was found on two occasions to be  $-18$  and  $-24$  per cent.

In February the gland was removed. Microscopic examination revealed diffuse tuberculosis.

After operation the neck again increased in size until the circumference was as great as before the intervention. From March 23 to June 1 four massive doses of deep roentgen-ray treatment were given with the result that the size of the neck became normal.

The patient then developed the clinical signs of myxœdema, becoming dull mentally and answering questions slowly. In September the basal metabolism was  $-23$  per cent. Accordingly 1 gr. of thyroid extract was administered three times a day for four days. At the end of this time the metabolism was  $-6.3$  per cent and  $-8.4$  per cent on successive days. The dosage of thyroid extract was then increased slightly, with the result that the basal metabolism reading rose to  $+10$  per cent. Two grains of thyroid extract were then given every other morning. At the end of a month the basal metabolism was  $+6$  per cent, the pulse was 66 per minute, and the patient was feeling well and seemed more normal to her family than she had for the last nine months. Her weight dropped from 142 to 123½ lb. With the idea of giving her rather too little thyroid than too much, 1 gr. doses were then administered every third morning. At the time this article was written the patient was in good condition.

This case is interesting because of the comparative rarity of tuberculosis primary in the thyroid. The decrease of approximately 20 per cent in the basal metabolic rate both before and after operation and treatment is interpreted as showing practically entire absence of thyroid tissue in the gland at the time of the first examination.

G. W. HOCHREIN.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Hodge, E. B.: Empyema in Children.** *Arch. Pediat.*, 1921, xxxviii, 18.

Experimental surgery on animals has shown that the mediastinal tissues offer little support against changes of pressure in the normal chest. In the ab-

sence of adhesions, the effects of positive intrapleural pressure on one side are almost as marked on the other side. To a certain degree this is true in the human subject, particularly in the child whose mediastinal tissues are more delicate. This has always been one of the drawbacks to intrathoracic surgery and has been met in recent years by the in-



roduction of the various forms of negative and positive pressure apparatus.

The presence or absence of adhesions has a most important bearing on both the diagnosis and the treatment of empyema. As a result of the study of large numbers of cases of empyema in the training camps during the influenza epidemic, the significance of the bacteriology of the condition as regards the prognosis and treatment has become much clearer. A large proportion of these cases were due to the hæmolytic streptococcus. The prognosis is most favorable in the pneumococcus type of empyema and least favorable in the streptococcus type. Both smears and cultures should be made of the fluid as often the condition is a mixed infection and not infrequently one type of micro-organism has died out and can be detected only in the smear.

Pleurisy is probably present over every large consolidated area in bronchopneumonia. Small effusions are common but large effusions are rare. Empyema is found in both bronchopneumonia and lobar pneumonia, but more frequently in the latter. Nine-tenths of the cases of empyema in children are associated with or follow pneumonia or pleuropneumonia, and the other one-tenth are due to acute infectious diseases, pyæmia, and suppurative foci elsewhere than in the lungs.

Children under 2 years of age are affected most frequently by the pneumococcus type of empyema. The left side is involved in three-fifths of the cases. The condition is bilateral in 3 per cent of the cases and is especially apt to involve both sides in infants. The younger the child with pneumonia the greater the probability that empyema will be a complication.

Localized or sacculated empyema is common but interlobar empyema is rare. The fluid in the streptococcus type is thinner and as a rule adhesions are absent. In the pneumococcus form adhesions are common, the pleuræ are thickened, and masses of fibrin are frequently present. The lung does not float, but if adhesions do not prevent, it is surrounded on all sides and compressed. As a result of this compression there are three types of recovery following empyema: (1) practically complete recovery; (2) limitation of expansion and recession of the chest wall because of the presence of very firm adhesions; (3) same as (2), plus low-grade interstitial pneumonia.

In children, empyema is a very serious complication. The mortality rate varies with the type of infection and the character and stage of the epidemic.

In the diagnosis the most reliable signs are flatness, feeble breathing, and heart displacement. Auscultation cannot be relied upon in the cases of children. Absence of tactile fremitus is often significant. The findings of the aspirating needle are decisive. The X-ray is helpful in demonstrating the location and extent of the fluid, but does not supplant the exploring needle.

Unresolved pneumonia is difficult to diagnose. There is dullness over one lobe and râles or friction sounds may be heard but there is never any cardiac displacement.

In cases of long-continued illness or wasting there is a possibility that chronic empyema may develop.

In treating the streptococcus type of empyema early rib resection or intercostal incision may cause too sudden and decided a change in the intrathoracic pressure. The aim should be to limit the extent of the open pneumothorax. Aspiration has not been successful as a curative measure and is used merely to relieve pressure and dyspnoea and to tide the patient over until adhesions have formed and his general condition is improved.

Intercostal incision is the operation most generally applicable to the cases of children and is often preceded by aspiration for temporary relief.

Formerly irrigation was never used in cases of acute empyema, but today flushing with sodium hypochlorite solution is common, and the use of the Carrel-Dakin technique has been found of benefit.

Rib resection is reserved chiefly for cases in which intercostal incision has proved inadequate and for old cases with sinus or rib necrosis. Both intercostal incision and rib resection can be done under local anaesthesia. General anaesthesia is necessary, however, when adhesions must be broken up or the patient shows evidences of fright.

Exercises to expand the lung should be begun as early as possible to supplement the operative measures. The author believes that more lives would be saved and mutilating operations for collapse of the chest wall would be almost entirely avoided if the scheme of graduated operative treatment were employed.

To offset the weakening effect of the profuse discharge in empyema the food intake should be raised.

MARGARET I. MALONEY.

#### Handley, W. S.: Lines of Advance in the Surgery of Breast Cancer. *Brit. M. J.*, 1921, i, 37.

Statistical study of the results of operations for cancer of the breast resulted in advances which culminated in the Halsted operation. This operation was for many years the best surgical eradication of mammary cancer. Granting that statistics give an idea regarding the value of a certain operation, it must be remembered that the possible variations in operative methods are infinite in number.

Stiles showed that cancerous lymphatics are widely diffused through the breast. He emphasized the necessity for wide removal of pectoral fascia and deprecated the removal of an unnecessary amount of skin. The operation suggested by him and practiced by Cheyne was much superior to that of Halsted. However, as Stiles studied only excised breasts he was unable to reach a correct conception of the manner in which the cancer spread. By postmortem examinations the author demonstrated the centrifugal spread of mammary cancer in the fascial lymphatic plexus and detected with the microscope its growing edge at points far removed from the breast. The only explanation fitting these facts is the now generally



accepted theory of permeation rather than the embolic theory of dissemination.

A criterion is thus provided for judging any suggested operation for mammary cancer. Technical variations must conform to the following conditions:

1. The primary growth from which centrifugal extension begins must always be the center of the area of operation.
2. A circular area of skin 4 or 5 in. in diameter and centered on the primary growth requires removal.
3. A circular area of deep fascia 10 or 12 in. in diameter and centered on the primary growth must be ablated.
4. The removal of deep fascia in the epigastric region is often too limited. A portion of the anterior sheath of the rectus should be removed to prevent extension of the growth into the peritoneal cavity.

The subclavian glands may be involved before the lower axillary glands on account of the occasional presence of a lymphatic trunk which passes from the mammary region through the pectoralis major. Recurrence presents as a deep lump below the middle of the clavicle and is sometimes apparently adherent to the bone. This type of recurrence is frequently seen by surgeons who do not dissect the axilla to its extreme apex. Operations are inadequate in which only a portion of the breast is removed for cancer or the axillary dissection is not made. Routine pathologic examination of every supposedly innocent tumor removed from the breast should never be omitted.

In the cases reviewed operation was not refused in any instance in which it was deemed possible to prolong the patient's life or make the end of her life more comfortable. Forty-eight per cent of the author's patients who could be traced were free from recurrence for three years. Recurrence in the scar and skin have been reduced to a low percentage. Isolated axillary recurrence or recurrence in the region of the subclavian glands has not been seen. Intrathoracic and hepatic recurrence was found in some cases, but the majority of recurrences were located in the supraclavicular and intercostal regions. The infrequency of local recurrence justifies the principles of the operation. The recurrences take place beyond the range of operation, either in the anterior mediastinal or the supraclavicular glands and, less often, in the viscera. These structures may have been invaded at the time of the original operation.

Recovery resulted in 6 cases in which the primary operation was extended to include exploration of the anterior mediastinum. In 2 cases the glands were found to be involved. One of these patients had widespread internal recurrence in six months, but the other was free from recurrence more than a year after operation.

Recurrence in the posterior triangle is seen just above the clavicle and below the posterior belly

of the omohyoid muscle. In the earlier stages of recurrence in this region the treatment is operative, but the operation must be thorough and systematic. If the cells have infiltrated the gland capsule and have passed into the surrounding tissues, operative treatment is futile. Radium is of value before operation in these cases as it reduces the risk of the implantation of cancer cells on the raw surfaces.

Surgery has been supplemented for many years by postoperative X-ray therapy. It is now known that cancer cells can be killed by adequate radiation and it is therefore hoped that any remaining groups of cancer cells will be destroyed.

It would be preferable to immunize the patient against his own cancer. Animal experimentation with mouse carcinoma and rat sarcoma has given some hope in this direction. Brief mention is made of the use of radium as a supplementary aid to surgery in mammary cancer. In addition to its destructive action on carcinoma cells it seems to have a special anodyne effect in some cases. Thirteen cases are cited in which the beneficial use of radium for postoperative recurrence was demonstrated.

Modification of the primary operation to include the supraclavicular and anterior mediastinal glands was rejected in 1919. Since then, radium has been employed in some cases at the time of operation as a prophylactic measure; tubes are placed at the inner ends of the first, second, and third intercostal spaces, the attached thread being brought out through the operative incision. Another tube may be placed underneath the skin and deep fascia in the lower and inner angle of the posterior triangle.

Open-air treatment is urged for its prophylactic value against recurrence and for the treatment of the chronic varieties of inoperable cancer.

MERLE R. HOON

## TRACHEA AND LUNGS

Lemon, W. S.: *Abscess of the Lung*. *Canadian M. Ass. J.*, 1920, x, 1079.

Fifty of 81 consecutive cases of pulmonary abscess observed in the Mayo Clinic were the result of a primary lung infection, such as pneumonia, a cold, grippe, pleurisy, asthma, measles, etc.; 17 were the result of operations about the mouth, nose, and throat; in 2 cases the abscess was due to septicæmia caused by trauma to the lung or its protecting wall; in 5 cases the condition followed an intra-abdominal operation; and in 12 cases no cause was determined.

The etiological factors in the 16 cases in which operation was performed in 1919 in the Mayo Clinic (Hedblom) were pneumonia, 4; grippe, 1; operations for tooth extraction, 3; tonsillectomy done elsewhere under general anesthesia, 2; gastro-enterostomy for ulcer, 1; trauma followed by pneumonia, 1; and unknown, 4.

Two main groups are encountered: cases of primary lung inflammation, and cases of abscess



due either to the entrance of septic emboli into the circulation at the site of operation or to direct aspiration of infected material. The latter event occurs usually in comatose or anæsthetized patients. Since abscess due to inspiration of foreign material during operation is preventable, care should be taken in the administration of the anæsthetic and with regard to the patient's position while he is unconscious.

In Lemon's series of cases the abscess was located 15 times in the upper lobes, 45 times in the lower lobes, and 8 times in the middle lobe. The right side was affected almost twice as often as the left. Abscess due to operation occurs as a rule in the upper lobes, but if all causes are considered, three times as many abscesses are encountered in the lower lobes. Abscess occurs predominately in males between the ages of 25 and 55; the youngest patient was 9 and the oldest 66. There were 70 males and 11 females in this series.

Symptoms complained of at the time of examination were dyspnoea in 10 cases, pain in the chest in 24, cough and profuse, foul-smelling sputum in 62, foul odor of breath in 6, intermittent fever in 16, hæmoptysis in 24, and progressive loss of weight and strength in 58.

The physical examination is less reliable than a well-taken history because: (1) there is nothing to distinguish the condition from a pneumonic lung unless the abscess is empty or superficial, and (2) if fluid is present in the pleural cavity, the physical signs are obscured by those of empyema. Roentgen-ray evidence is invaluable in the diagnosis, especially in cases of aspiration, but some difficulty may be encountered in the X-ray diagnosis of abscess of the lower lobe when fluid or pleural thickening is present. Empyema is the most common complication of abscess; hæmorrhage, cerebral abscess, amyloidosis, and pyæmia occur, but are infrequent. The differentiation of abscess and tuberculosis, bronchiectasis, and gangrene is often exceedingly difficult and depends on a careful study of the anamnesis, sputum, and X-ray evidence.

The treatment demands the co-operation of the internist and surgeon since recovery depends on the establishment of drainage either by natural or surgical measures. Acute multiple abscesses cannot drain and always cause death. Aspiration abscesses, regardless of their size, may drain through the bronchus, cicatrize, and become obliterated. Medical treatment consists of forced feeding, rest, sunshine, open air, and alkalization. When no further improvement can be effected, or if retrogression occurs, operation is advisable. Of the 16 patients operated on by Hedblom in 1919, 3 died, a mortality of 18.7 per cent. Norris and Landis give the mortality of cases operated upon as 25 per cent and of cases not operated upon as 50 per cent. In Walker's series the mortality in cases of acute abscess treated medically was 54 per cent while in those treated surgically, it was 25 per cent.

A. C. JOHNSON.

## HEART AND VASCULAR SYSTEM

**Moire, P., and Soupault, R.: Wound of the Heart; Suture and Recovery** (Plaie du cœur; suture; guérison). *Presse méd.*, Par., 1921, xxix, 95.

The authors operated upon a man 48 years of age who, half an hour previously, had been stabbed in the precordial region. The sternum was divided by a median vertical incision extending from the base of the xiphoid appendix to the third costal cartilage. Transverse incisions were then made at the two extremities of the vertical incision, one passing through the second, and the other through the sixth space, and the flap so formed was turned back toward the left.

The pleural cavity having been already opened by the stab wound, a progressive but harmless pneumothorax had developed. A hæmothorax of from 200 to 300 c.cm., and a hæmopericardium of about 150 c.cm. were cleared. In the heart wall, just to the right of the intraventricular septum, a small linear wound about 1 cm. long was found. Two catgut sutures were immediately placed in this opening in spite of a jet of blood about 20 cm. in height which occurred at each systole. The Reverdin curved needle was used without bringing the heart to the surface of the body. Perfect hæmostasis was obtained. The heart and the anterior surface of the left lung were then explored. The pericardium was closed with U-sutures of catgut, the sternocostal flap replaced, and the external wound entirely closed except that provision was made for superficial drainage. The operation consumed thirty-five minutes. Physiological salt solution, camphorated oil, and morphine were administered. Anæsthesia was induced with ether.

At the end of the operation the pulse was 104. Postoperatively seropurulent fluid collected in the anterior pleural space outside and beneath the pericardium and drained externally through a fistula. This condition was remedied by an operation under general anæsthesia and the patient then made a normal recovery, leaving the hospital two months later and being at once able to resume an arduous occupation.

W. A. BRENNAN.

## PHARYNX AND ŒSOPHAGUS

**Bevan, A. D.: Diverticula of the Œsophagus.** *J. Am. M. Ass.*, 1921, lxxvi, 285.

Pulsion diverticula of the œsophagus, like inguinal herniæ, always occur at exactly the same point. They present themselves at the junction of the œsophagus and the pharynx in the median line posteriorly. At this point there is a triangular area where the oblique muscles of the pharynx and the transverse circular muscles of the œsophagus meet, leaving a small area covered simply with a subcutaneous layer. When a diverticulum develops, it is probable that there is more than the usual normal weakness at this point, probably a congenital absence of muscle fiber over a large area, which permits



a pushing out of the mucosa and submucosa in the process of deglutition so that with this impulse applied to the weak area during swallowing a pouch of mucous membrane and submucosa is forced out through the small triangular defect. The neck of the pouch always remains comparatively small. The pouch itself may reach a size sufficient to hold 12 oz. or even more.

Traction diverticula may occur at any point, especially within the thorax, and as a rule are caused by cicatricial contraction of some old inflammatory process which draws the wall of the œsophagus outward and forms a more or less funnel-shaped diverticulum.

Many of the small pulsion diverticula are of little importance, being associated merely with slight irritation in swallowing and occasionally slight regurgitation, and producing no great amount of discomfort and no serious effect on the health. Diverticula of larger size, however, may become a serious menace and in some cases may prove fatal.

In cases of small diverticula causing little distress and no impairment of the general health operation may be safely delayed if the patient so desires until the symptoms become more annoying. On the other hand, because of the fact that these small diverticula can be cured so safely and readily, the author believes that good judgment would dictate an operation unless there is some special contra-indication such as the patient's age or an organic lesion.

Bevan has devised a plan of operation which has for its purpose the obliteration of the diverticulum with the minimum danger of leakage. He performs all such operations under local anæsthesia induced with 0.5 per cent procaine or apothesine solution in distilled water with 1:200,000 epinephrin. The incision is made usually on the left side. The tissues on the inner side of the left sternocleidomastoid from the hyoid bone down to the sternum are thoroughly infiltrated. The skin and superficial fascia are then divided for a distance of 5 or 6 in. along the inner border of the sternocleidomastoid. The sternocleidomastoid then being drawn to the outer side with retractors, the deep cervical fascia is divided parallel with the external incision, and the great vessels of the neck, the internal jugular and carotid, and the pneumogastric nerve are drawn to the outer side. The thyroid gland, the sternohyoid,

and the sternothyroid are drawn to the inner side. At the base of the wound the inferior thyroid artery is frequently found to interfere with the free exposure of the diverticulum. It then must be doubly ligated and divided between ligatures. In most of the author's cases he has found that the diverticulum lies in some loose areolar tissue and that it can be readily pulled into view. Dissecting forceps without teeth should be used and in drawing the diverticulum from its bed care is necessary to avoid rupturing its coats. If the diverticulum is small, that is to say, from 2 to 2½ in. long and not more than 1 in. across, it may be readily handled by invaginating it into the œsophagus with three purse-string sutures as a diverticulum of this size invaginated into the œsophagus is not harmful. When the diverticulum is large, one-half of it should be invaginated into the other half with three pursestring sutures of black silk or Pagenstecher linen and obliterated by six or eight longitudinal sutures running parallel with its long axis. In some cases a large diverticulum may be crushed at its center with a pair of heavy forceps, tied with a silk ligature, and the portion distal to the ligature cut off with the electric cautery. The remaining portion may then be invaginated into the œsophagus with three purse-string sutures.

The subsequent steps in the operation consist simply in inserting a soft rubber tube containing a strand of iodoform gauze leading from the center of the wound in the œsophagus to the middle of the external incision and closing the rest of the wound. The soft rubber drain should be removed at the end of forty-eight hours.

The patient is fed through a No. 14 American catheter introduced into the œsophagus three times a day. Swallowing should not be allowed until wound healing is complete — about ten days.

Three points especially to be emphasized regarding the ordinary handling of these cases are: (1) in the extremely rare case in which the patient is so reduced by starvation that he has little or no resisting power, a gastrostomy should be done so that he may be fed and his condition improved before the operation on the diverticulum is undertaken; (2) the importance of local anæsthesia; (3) the importance of a technique such as has been described, which will prevent the risks of leakage and infection.

C. W. HOCHREIN.

## SURGERY OF THE ABDOMEN

### ABDOMINAL WALL AND PERITONEUM

Newbolt, G. P.: The Radical Cure of Femoral Hernia by the Inguinal Route. *Brit. M. J.*, 1921, i, 15.

In the author's opinion femoral hernia should be operated on by the inguinal route rather than through the saphenous opening as when the former is used there is greater likelihood of permanent

cure, the intestine can readily be examined and resected if necessary, and abnormal vessels are avoided.

Operation by the inguinal route is more difficult than operation through the falciform ligament. It is generally easier to perform on females than on males as in males the cord obstructs. The passage of the needle when Cooper's ligament is sutured to the conjoined tendon is troublesome, especially when



the patient is stout. The conjoined tendon should be sutured to the posterior border of the ring.

A. J. SCHOLL, JR.

**Beneke, R., and Lorenz, A.: A Case of Complete Duodenojejunal Hernia (Retroperitonealis Treitzii)** (Ein Fall von Hernia duodenojejunalis sin. [retroperitonealis Treitzii] completa). *Deutsche Ztschr. f. Chir.*, 1920, clx, 1.

The hernia was found at autopsy in the body of a man 45 years of age who had died of nephritis. The autopsy report is given in detail. The sac consisted of peritoneum of the duodenojejunalis fossa and contained the entire small bowel from the duodenum to the cæcum.

According to Broesicke, a true Treitz hernia is characterized by the following points:

1. The mesenteric vein and left colic artery pass for a longer or shorter distance in the anterior or upper free border of the hernial aperture.
2. The hernia pushes itself either into the transverse mesocolon or the descending mesocolon.
3. The hernial sac therefore consists of only one layer where it overlies the retroperitoneal organs and of two layers in every other region. The hernia does not produce clinical symptoms. Pikin states that of 91 cases of hernia duodenojejunalis or para-jejunalis described, 17 came to operation. Of these, only 3 were diagnosed previously. KOERBL (Z).

#### GASTRO-INTESTINAL TRACT

**Georgesco, G.: Pyloric Exclusion by a Modification of the Biondi Method** (L'exclusion du pylore par le procédé de Biondi modifié). *Presse méd.*, Par., 1921, xxix, 75.

Exclusion of the pylorus may be done either by complete section or by stricturing the sphincter by a plastic operation or the application of a close ligature on the serosa. To combine the advantages of both methods the author has recently employed in three cases of pyloric ulcer the method of Biondi slightly modified.

In Biondi's method the pyloric circulation is interrupted by section of the dissected mucosa. The modification of this procedure consists in crushing and ligating the mucosa which is sectioned by the thermocautery to prevent infection of the operative field. When pyloric exclusion is indicated after gastro-enterostomy the seromuscular tissue is sectioned from a point 1 cm. from the lesser curvature to a point 1 cm. from the greater curvature. The edges of the seromuscular wound are dissected from the subjacent mucosa to some extent from one side to the other and this dissection is continued with curved scissors toward the two edges of the organ. As the mucosa is often altered and friable, the dissection is facilitated by introducing a spatula between the mucosa and musculature of the posterior wall.

When the mucosa has been completely dissected around, it is stretched over the spatula, crushed by

a crushing forceps, tied with two threads, and sectioned with the thermocautery between the ligatures. The transverse seromuscular incision is converted into a longitudinal incision as in the Heinicke-Mikulicz operation and inverted with the aid of a thread which approximates the two extremities of the wound. The seromuscular sutures are buried under Lembert serous sutures. The lumen of the organ is then completely obliterated.

One of the chief advantages of this technique is its strict asepsis. The mucosa is not opened at any time, and as the serous and muscular sutures are placed under strictly aseptic conditions, they have no tendency to rupture, a frequent complication when the wall is completely sectioned.

W. A. BRENNAN.

**Miller, T. G.: Polypoid Carcinoma of the Stomach; Report of a Case Diagnosed as Primary Pernicious Anæmia Eighteen Months before Death.** *J. Am. M. Ass.*, 1921, lxxvi, 229.

This case of carcinoma of the stomach is presented because of the unusual clinical picture which was noted for eighteen months before the patient's death and which, after careful study by competent clinicians, led to a diagnosis of primary pernicious anæmia.

The patient, a male 31 years of age, was admitted to the hospital November 12, 1919, complaining chiefly of pain in the upper abdomen. In May, 1918, he had been treated at the Army Base Hospital at Camp Meade, Md., for weakness and sleepiness which had developed in the course of two or three weeks. At that time his red blood cells numbered 1,000,000 and his hæmoglobin was 40 per cent. A diagnosis of pernicious anæmia was made and he was given five blood transfusions of about 300 c.cm. each. His condition improved and a few months later he was discharged from the hospital and from the army still showing signs of improvement.

In September, 1919, he noted that he was losing weight. On October 20 he consulted a physician, who ordered starvation for sixty hours to be followed by a milk diet. On the second day of this diet a sharp pain began in the left upper abdominal quadrant just under the costal margin. This persisted except when it was relieved by opiates. It showed no relation to the ingestion of food. There had been no nausea, vomiting, or gaseous eructations.

When the patient was admitted to the hospital for the second time a mass was palpated below the right costal margin just to the right of the xiphoid. This mass moved with respiration, and when the patient turned on his left side it dropped to the left, apparently riding over the abdominal aorta. When the epigastrium was observed closely, peristaltic waves were seen traveling from left to right across the stomach area toward the mass. As these waves reached the median line a distinct squirt was noted with the stethoscope.

The blood examination revealed 4,800,000 red cells, 7,400 white cells, and 82 per cent hæmoglobin.



The Ewald test meal showed no free hydrochloric acid and a total acidity of 10. The findings of the roentgenological examination were as follows:

Six hours after an opaque meal the stomach showed an almost complete residue. It was moderately dilated, vertical, and low. The greater curvature was about 3 in. below the umbilicus. There was very marked hyperperistalsis with deep segmenting waves. The waves reached the pylorus without interference. In the portion of the greater curvature which was lowest when the patient was prone, a large, clear area about the size of a silver dollar was noted which seemed to indicate a mass within the stomach. The outline of the stomach was regular in this area. The duodenum showed a constant filling defect strongly suggesting duodenal ulcer.

The conclusion was drawn that the patient had a gastric neoplasm involving the most dependent portion of the greater curvature, and that the palpable epigastric mass was probably of the same nature, involved the duodenum, and was the cause of the constant filling defect noted by the roentgenologist. An enlarged mass in the neck was considered to be a glandular metastasis from the gastric lesion.

On November 22, 1919, the patient was operated on by Deaver. An incurable malignant condition was discovered. Following the operation the patient grew steadily weaker and died December 12. Autopsy was not permitted.

The interesting features in this case are:

1. The occurrence eighteen months before death of an anemia of such a degree as to suggest that it was of the primary pernicious type and probably dependent on hæmorrhage from a primary benign lesion.

2. The probability that the malignant change was secondary to a benign adenoma.

3. The polypoid nature of the tumor, without gross evidence of involvement of the deeper structures of the wall, and yet with unquestionable metastasis.

MARGARET I. MALONEY.

#### Collins, A. N.: Peritonitis and Intestinal Intubation. *Minnesota Med.*, 1921, iv, 9.

Clinical signs of intestinal obstruction are present in cases of well-defined diffuse peritonitis, and death may be expected unless this condition is relieved. The mortality following peritonitis is notoriously high. Death in such cases has been ascribed to various causes including: (1) mechanical stasis and toxæmia, (2) incompetency of the ileocecal valve and reflux of colonic contents, (3) stenosis of the ileocecal valve preventing passage of intestinal contents, (4) obstructive conditions of the sigmoid, and (5) perverted secretion of the mucosa.

Intubation for intestinal drainage was first introduced in England by Paul in 1891 and in the United States by Mixter in 1895. Both writers advocated the use of a glass tube. Lund in 1903 recommended ileostomy and recorded five cases with four recoveries. Cooney in 1919 suggested the

introduction of a catheter through the appendix stump and reported twenty recoveries in twenty-two cases so treated. The author treated two patients by this method; the first recovered, but the second died. At autopsy in the second case it was found that the tube was in correct position without leakage and the colon was collapsed, but the small intestines were distended and contained a large quantity of liquid feces.

The author has devised a tube and a procedure for its use following the idea of Cooney. Quarter-inch perforations are cut in a non-collapsible rubber tube  $\frac{1}{4}$  in. in diameter at intervals of about 1 in. This tube is then passed through the amputated stump of the appendix and ileocecal valve until the last perforation is within the cæcum. The tube is anchored with a pursestring suture and the cæcum is attached to the anterior abdominal wall, the omentum being interposed between the gut and the peritoneum. Peritoneal drainage is obtained through the opposite angle of the wound. A small catheter may be passed through the intestinal tube for the injection of irrigants or nourishment. After the removal of the tube the sleeve of the appendix stump collapses and healing takes place readily.

MERLE R. HOON.

#### Froome: A Rare Case of Ileus Following Gastro-Enterostomy (Ueber eine seltene Form von Ileus nach Gastroenterostomie). *Zentralbl. f. Chir.*, 1920, xlvii, 1505.

After gastro-enterostomy a loop of bowel may slip through the ring formed by bringing the small bowel to the stomach. In such cases a sort of internal hernia results. Following a posterior gastro-enterostomy this hernia is bounded posteriorly by the parietal peritoneum, above by the mesocolon, and anteriorly and below by the loop of bowel and its mesentery, while following anterior gastro-enterostomy it is bounded posteriorly by the parietal peritoneum, posteriorly and above by the mesocolon and transverse colon with the greater omentum, and anteriorly by the loops of small intestine and their mesentery.

The author reports a fatal case of hernia of this kind following posterior gastro-enterostomy and discusses 22 similar cases reported in the literature. Among the latter the obstruction occurred only 4 times following an anterior gastro-enterostomy. The obstruction developing after posterior gastro-enterostomy is formed in one of two ways; either the efferent loop of small intestine advances through the ring so far that it becomes kinked at the site of anastomosis without strangulation at the hernial outlet or some other loop of bowel passes through the artificially formed ring and is strangulated. To prevent this complication the author sutures the ligament of Treitz to the loop of the bowel used in the anastomosis of posterior gastro-enterostomy or sutures the afferent loop of bowel to the posterior peritoneum to close the ring.

FLESCHE-THIBESIIUS (Z).



**Goebel: A Common Ileocolic Mesentery as a Cause of the Hirschsprung Syndrome** (Mesenterium commune ileocolicum als Ursache eines Hirschsprungschen Symptomenkomplexes). *Arch. f. Kinderh.*, 1920, lxxviii, 221.

The patient, a 7-months-old child, was observed for five months. The abdomen was distended like a balloon, and occasionally a moderately severe spasm of the bowel in the region of the right hypochondrium was noted. There was a large and easily replaceable scrotal hernia on each side and hypospadias urethralis scrotalis. The bowel action was very good; never any constipation. A small-caliber stomach sound could be introduced for a distance of 88 cm. This caused the evacuation of a considerable amount of gas which decreased the size of the abdomen from 47 to 41 cm. Occasionally the sound became obstructed 15 cm. deep in the left hernial sac, but after reposition of the hernia could be advanced further. When the hernia was reduced a large amount of gas was evacuated. The left hernia, therefore, constituted an obstruction to the passage of gas. Prolapse of the rectum was greatest (14 cm.) when the left hernia was replaced. The resulting explosive evacuation of gas was due to the correction of a kink in the sigmoid.

The condition was well demonstrated by X-ray pictures made with the sound *in situ*. The sigmoid flexure was large and very freely movable. The entire colon, including the cæcum, ascending colon, and transverse colon lay completely to the left. The mesocolon of the ascending colon was therefore abnormally long.

At autopsy it was found that the small and large bowels had a common mesentery as far as the splenic flexure. The ascending mesocolon was 7 cm. in length. The ascending colon was longer than normal and formed an S-shaped loop which was moderately dilated. There was gradually increasing dilatation to the middle of the transverse colon and then a narrow portion for a distance of 4 cm. The left half of the transverse colon formed a loop. The splenic flexure was fixed in its normal position. The descending colon was contracted and fixed. The sigmoid flexure, which was not dilated, completely filled the sac of the left scrotal hernia and had a long mesentery. The mesentery of the small bowel was abnormally long. There was torsion of 180 degrees but no circulatory disturbance. A horse-shoe kidney was found.

The cause of the entire syndrome was the malformation of the mesentery. This was associated with malformations of the urogenital system; therefore the bilateral herniæ were malformations of the peritoneum. In the entire German literature, with perhaps 2 exceptions, there is no suggestion that malformations of the mesentery may be a cause of Hirschsprung's disease. Navarro explains Hirschsprung's disease as an anomaly of development due to insufficient rotation of the large bowel. This theory is confirmed by the findings during the sixth month of embryonic life. The author believes that

in most cases, exclusive of those with spasm, Hirschsprung's disease is due entirely to an arrest in the development of the mesentery resulting in a more or less completely developed mesenterium for both the ileum and the colon.

WORTMANN (Z).

**Frank, L.: Intussusception of the Colon Caused by an Anatomical Defect; A Case Report.** *Am. J. Surg.*, 1921, xxxv, 12.

Frank reports the case of a child, 2 years and 9 months of age, who was brought to him on May 10, 1919, with the diagnosis of intussusception. He immediately opened the abdomen and found the entire cæcum and ascending colon invaginated into the remaining portion of the large intestine and presenting at the anal outlet.

The invagination was easily reduced. It was then noted that the entire ascending colon and cæcum were "hanging loose" within the abdominal cavity and that there was tremendous engorgement of the mesenteric vessels of the ileum and of the ascending colon.

After the operation the child presented no further symptoms referable to the abdomen.

The feature worthy of note in this case was that the entire cæcum, the ascending colon, and part of the transverse colon were freely intraperitoneal. This was not due to stretching of the normal attachments, but represented an anatomical defect of congenital origin. When the large intestine was lifted from the abdominal cavity it was noted that the lower part of the ascending colon and cæcum had no mesenteric attachment.

After reduction of the intussusception it was found that the entire small intestine occupied the upper right abdominal quadrant, and that the descending colon, the transverse colon, the cæcum, and the ascending colon had gravitated to the lower part of the abdominal cavity. The anatomical defect was overcome by anchoring these structures in their proper positions. This procedure left underneath two fossæ through which herniation is possible. It is presumed the anomaly was the cause of the intussusception.

MARGARET I. MALONEY.

**Duval, P., and Roux, C.: Stasis in the Ascending Colon and Its Surgical Treatment** (La stase stercorale caeco-ascendante et son traitement chirurgical). *Arch. d. mal. de l'appar. digest.*, 1920, x, 705.

Retention of feces in the ascending colon is associated with general disturbances due to the intoxication and sometimes the infection of the organism. Retention in the descending colon, which is the most common type of constipation, is purely mechanical.

From the surgical standpoint the authors distinguish the following pathologic conditions in the ascending colon: (1) mobile cæcum, the defective coalescence being confined to the lower half or third of the ascending colon; (2) mobility of the ascending colon extending as far as, and including, the



hepatic angle and associated with membranous pericolic; (3) slight mobility of the ascending colon associated with severe pericolic; (4) mucous colitis; and (5) parietal colitis.

These conditions are due to congenital malformations which favor stasis because of the abnormal mobility of the colon and pericolic membrane. The mobility reacts on the membrane which in turn reacts upon the colon, and the consequent colitis and pericolic lead to the formation of adhesions and infection of the bowel walls.

Constipation in the ascending colon has three marked symptoms: pain in the lower right abdomen; diarrhoeic constipation; and disturbances of the general condition due to chronic intoxication or some infectious process. Combinations of these were observed in all the cases studied by the authors.

Medical treatment is of no value except in mild cases. The functional disability can be overcome only by surgical procedures. In the authors' opinion colectomy should be reserved for cases in which the bowel wall is definitely altered and cases of chronic segmental parietal colitis. When the wall is not altered and only the mucosa is inflamed, conservative methods will establish correct evacuation.

As the cause of the type of stasis under discussion may be abnormal mobility of either a part or all of the ascending colon, or pericolic, or both, the operative treatment varies with the case. Colon mobility is treated by colon fixation while strangulation due to the pericolic membrane may be overcome by the removal of this membrane and a plastic procedure to prevent its recurrence. Colon mobility associated with atresia due to pericolicitis can be treated only by a combination of both methods.

In colon fixation the authors have demonstrated the value and permanence of fixation of the cæcum to the posterior abdominal wall. They are not so sure regarding the merit of fixation to the anterior wall.

In the removal of the pericolic membrane the authors have not found oil injections or similar methods of any value in preventing the formation of new adhesions. They have obtained excellent results, however, from the use of omental grafts. These results, both experimental and operative, have persisted for more than a year and have been verified by means of the X-ray.

The article is concluded with a discussion of the applicability of different surgical procedures to the various surgical lesions of the ascending colon. In mucous colitis permanent drainage of the inflated and infected colon is imperative. Cæcosigmoidostomy, which drains the colon at its lowest point, is the operation of choice.

Attention is directed also to the necessity for postoperative medical and dietetic treatment.

W. A. BRENNAN.

**Van Hook, W.: Colon Injury in Nephrectomy.**  
*N. York M. J.*, 1921, cxiii, 23.

The author's patient presented herself with chronic and acute intestinal obstruction. Because

of the severe abdominal distension and general toxæmia a cæcal fistula was made to give temporary relief. Two years previously, following the removal of the left kidney, a fæcal fistula developed. When patent, this fistula gave relief from discomfort, but when it became closed great distress was caused by bowel distention.

After the patient recovered from the intestinal obstruction the old nephrectomy wound was opened and extended downward. It was then found that the splenic flexure was bound down, damaged, and occluded. The bowel evidently had been caught in the clamp used to compress the kidney stump. Since there was no active disease at the site of occlusion, nothing was done at the immediate point of injury, but the bowel above was joined by anastomosis to the descending colon below. This procedure, colocolostomy, resulted in complete and satisfactory re-establishment of the fæcal current.

The author draws the following conclusions:

1. Injuries of the left colon take place readily when left nephrectomy is practised.

2. Damage so severe as to cause intestinal obstruction, however, must be rare and the result of gross carelessness.

3. In acute intestinal obstruction life may be saved as a rule if a fæcal fistula is established at the cæcum for a few days. This tides the patient over the toxic period.

4. Colocolostomy satisfactorily re-establishes the fæcal current, making it unnecessary to work at the site of scar contraction where wound infection from the bowel may easily occur.

G. W. HOCHREIN.

**Lane, W. A.: The Hunterian Lecture on Colectomy.**  
*Lancet*, 1921, cc, 207.

Brief mention is made of the early and late effects of chronic intestinal stasis on the various organs of the body. Up to a certain point medical treatment may alleviate the degree and effects of auto-intoxication. If the symptoms of this condition are accentuated by bands, appendiceal inflammation, or gastric or duodenal ulcer, surgery must be resorted to at once. If surgical treatment of these conditions fails the diseased and obstructed colon must be removed.

Among the many diseases which depend directly or indirectly on auto-intoxication the following are mentioned: rheumatoid arthritis, Still's disease, tuberculosis, Bright's disease, non-luetic arteritis obliterans, Raynaud's disease, Addison's disease, melancholia, dementia præcox, pernicious anæmia, asthma, angina pectoris, ulcerative colitis, and diabetes. Many of these may be benefited by colectomy.

The method of choice is division of the ileum several inches from its termination and removal of the large bowel, only enough of the colon being left to permit a perfect end-to-end anastomosis with the end of the ileum.

The two complications most apt to affect operation disadvantageously are obstruction due to



inflammatory adhesions and excessive elongation of the pelvic colon. The former may be relieved by operative interference while the latter may be prevented by evacuating the residual colon three times a day. The chief immediate risks of the operation are hæmorrhage, damage to the bowel, and shock. Shock may be prevented by introducing 6 or 7 pt. of saline into the axilla. This should be begun as soon as possible after the induction of anæsthesia is begun. Rotation of the ileum at the time of the anastomosis should be avoided as this will result in a twist.

As the bowel wall is flaccid and inert because of previous stagnation and consequent atrophy, castor oil or phenolsulphonephthalein should be added to the paraffin which is administered as soon as possible after the operation. Adhesions should be prevented by careful peritonization, proper ligation of the mesentery and omentum, and early stimulation of the intestines. Adhesions from previous operations may increase the risk and eventually become the cause of obstruction. The surgeon must act promptly when confronted by this condition.

The mortality from colectomy depends on the types of patients which the surgeon accepts for operation. If he considers the patient's welfare before favorable statistics, he will assume greater risks.

MERLE R. HOON.

**Sheen, A. W.: On the End-Results of Colectomies for Intestinal Stasis.** *Brit. M. J.*, 1921, i, 116.

The author reports the results of 4 colectomies for stasis after a period of five years and ten months. One of the patients died. The other 3 showed marked improvement which in 2 instances might be termed complete. One patient has a ventral hernia; 1 has adhesions due probably to a peritoneal disturbance bringing latent infection into activity or secondary to a parietal infection; and the third has occasional diarrhoea due to the removal of the colon.

Most writers in reporting cases of this type do not lay sufficient stress on parietal infections. In toxic persons micro-organisms are present in the peritoneal cavity which the peritoneum is able to withstand but the parietes cannot; or the micro-organisms in the depths of the parietes are stirred into activity by the injury inflicted. The bacterium commonly found in these infections is the bacillus coli. To combat this type of infection Lane uses sterilized hot boracic fomentations which are changed hourly after operation. Even with our present knowledge regarding the prevention of infections and adhesions such undesirable sequelæ will be more marked in this class of case than following other types of abdominal operations. The greater the "germ-soaked" condition of the patient the greater the risk.

Sheen accepts the toxæmia theory and the assumption that the condition is due to the blocking of the "ileal effluent" caused by displacements and kinks and adhesions of the cæcum and colon. These

may be due to upright posture, habitual constipation, and, in women, tight clothing. The germ invasion and absorption take place in the ileum; the colon is the mechanical factor. The symptoms vary with the degree and severity of the infection.

Because of its seriousness and questionable results, colectomy is not generally acceptable and the mortality is difficult to ascertain. The patients are divided into three classes: (1) those who recover and are greatly benefited, (2) those who die, and (3) those who neither die nor recover, but live in almost hopeless discomfort.

Ileocolostomy, the suggested alternative for colectomy, is surgically unsatisfactory because of the dead "bag" of colon left. Various other abdominal operations may be performed and toxæmia previously present may disappear. The good results of such operations are claimed to be due to the freeing of the ileal effluent. One surgeon quoted obtained excellent results from nephropexy without even opening the abdomen.

Waugh attributes the impairment of mechanical efficiency of the bowel with its resulting manifold evidence of tissue degeneration similar to that for which colectomy is advocated to an ascending colon which has retained and perhaps elongated its primitive mesentery; this developmental survival is present in perhaps 20 per cent of persons. Fixation of the colon, an easy and safe operation, cures the condition and causes the symptoms of stasis to disappear. Here again the appendix is removed, the ileal effluent being freed. In all of several cases in which the author has carried out this operation there has been immediate improvement.

Every patient should be treated in accordance with the special indications presented. Surgery is not the only remedy. In both operative and non-operative treatment the psychic factor must not be overlooked. The prevention of stasis and toxic foci should be begun in babyhood.

J. E. STRUTHERS.

**LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN**

**Riesman, D.: Spontaneous and Operative Cure of Cirrhosis of the Liver: Report of Illustrative Cases.** *J. Am. M. Ass.*, 1921, lxxvi, 288.

Riesman reports three cases of cirrhosis of the liver followed by recovery.

The first case was that of a man 57 years of age who had been addicted to the use of alcohol all his life. He was admitted to the hospital Oct. 11, 1910, on account of a fracture of the left wrist, but was later transferred to the medical ward with a diagnosis of cirrhosis of the liver. When first seen by the author he had marked ascites with general enlargement of the veins of the abdomen and a very typical caput medusæ. Soon after his admission to the medical ward he had a profuse hæmorrhage which, in all probability, had its origin in the lower end of the œsophagus or the stomach. Œdema of the



legs began about the beginning of November and the abdomen became more tense. The patient at first refused to permit tapping but finally yielded. After the tapping the liver and spleen could be felt distinctly. From this time on, tapping was necessary at intervals. At each tapping, except the last, from  $3\frac{1}{2}$  to  $4\frac{1}{2}$  gal. of a straw-colored fluid were removed. The oedema of the legs steadily increased, however, and the scrotum became greatly swollen. Toward the end of November, 1911, the patient grew irritable and a few days later a persistent hiccup began. The irritable mental state then gave place to a stupor and it was thought that death would soon follow.

Several days later, while making a casual examination, the author detected over the abdomen, particularly in the region of the liver and spleen, an exquisite friction appreciable both to the touch and to the ear. Over this area there was considerable tenderness. He then learned that the patient had had much pain subsequent to the last tapping and had been receiving small doses of morphine for its control.

The abdomen did not fill up again. The oedema of the legs and scrotum disappeared and the patient's former amiability soon returned. Eventually he was able to be up and about and left the hospital. He was still living at the time this paper was written.

The history and symptoms in this case were typical of cirrhosis of the liver. There was no history of syphilis; in fact, no history of anything abnormal except alcoholism. The oedema of the legs and scrotum was attributed to thrombosis of the lower vena cava, but its spontaneous disappearance proved that this theory was incorrect. The miraculous cure is explained by the assumption that a fibrinous peritonitis followed the last tapping and the adhesions resulting from this condition constituted a spontaneous Talma operation and established a collateral circulation.

The author's second case was that of a man aged 53 who had been in the habit of smoking to excess but had never used alcohol. In June, 1915, after eating three bananas he had a violent attack of colic. Soon afterward the abdomen began to fill with fluid and tapping became necessary. In August an exploratory operation was performed. The liver was found to be the seat of a manifest cirrhosis and a Talma operation was done. The patient was brought back to the author a month later, at which time the liver was enlarged and finely nodular, the spleen was enlarged, and the abdomen was full of fluid. On October 7 tapping was done. In a short time fluid was again demonstrated but did not reach any considerable amount. Eventually it became absorbed so that no further tapping was necessary. A year after the operation the patient was able to walk five miles without the slightest trouble, and four and one-half years after the operation he was well except that the urine occasionally contained traces of sugar and albumin and a few hyaline casts.

The third case was that of a man 62 years of age, who had been a heavy drinker of beer and whiskey for twenty years. In February, 1919, without any apparent cause his abdomen began to swell. On April 20, when the patient was admitted to the hospital, the clinical picture was that of cirrhosis of the liver. The abdomen was greatly distended and the veins were much enlarged. The liver and spleen could not be palpated. On May 3 tapping was done. After the tapping the liver could be felt 3 in. below the costal margin; it was hard, finely nodular, and tender. From May 3 until October 22, 17 tapings were done.

On October 22 an operation was performed. Just before this operation about 9 qt. of fluid were removed from the abdominal cavity by tapping. A right rectus incision was then made over the gall-bladder and the remaining fluid was removed with towels. The upper surface of the liver, the spleen, and the adjacent peritoneum were rubbed with gauze until a slight exudation of blood resulted. The omentum was sutured to the anterior abdominal wall with four catgut sutures, and its lower portion was sutured in the abdominal incision just below the skin. A rubber drainage tube was inserted in the pelvis. Convalescence was uneventful and the patient was dismissed from the hospital in a few weeks virtually well.

Cirrhosis of the liver is one of the few chronic, non-bacterial visceral diseases—perhaps the only one—which may be actually cured. When it is dependent on syphilis, a striking therapeutic result such as was obtained in the cases reported is more easily comprehended. In none of the author's cases, however, was syphilitic infection demonstrated.

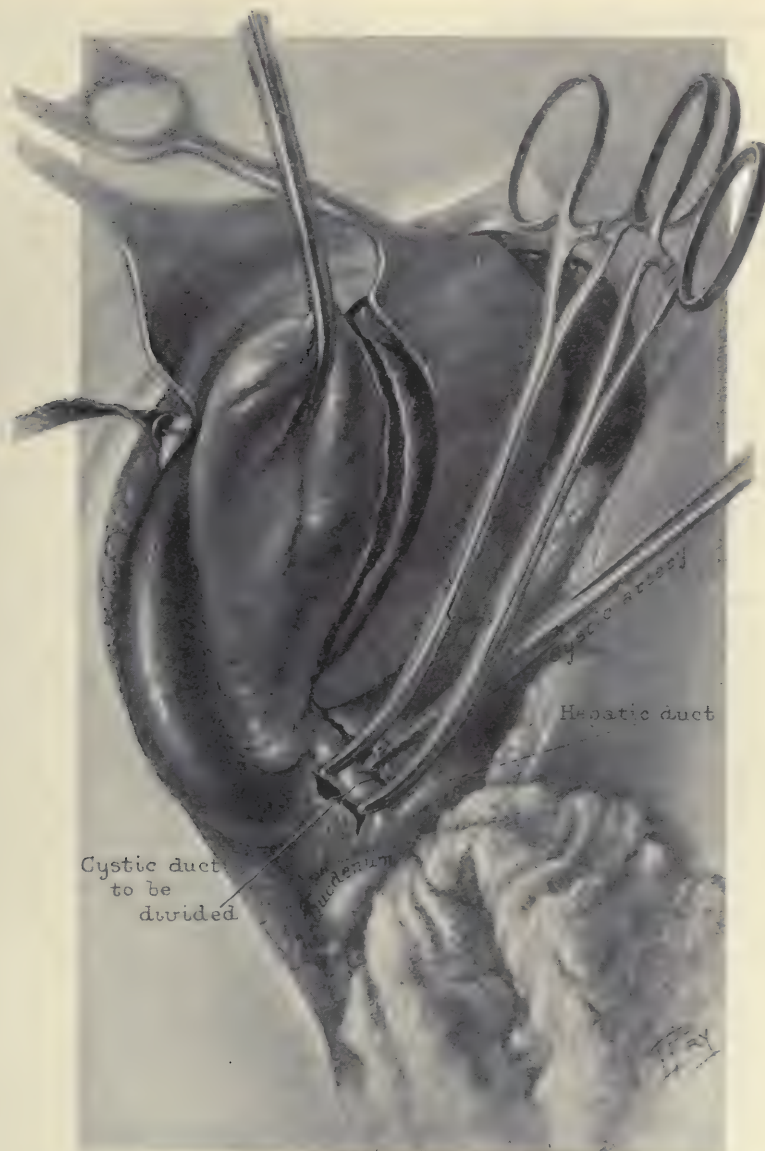
The cure of cirrhosis by the Talma operation cannot be due merely to the establishment of an adequate circulation. The liver itself must undergo a change, and probably also the spleen. In the author's opinion the spleen is involved by the cirrhotic process to a greater degree than is generally supposed. The final result may be satisfactory even when one or two tapings are necessary after the Talma operation.

G. W. HOCHREIN

**Mayo, C. H.: Cholecystectomy with Modified Drainage. *Minnesota Med.*, 1921, iv, 1.**

In the surgery of the gall-bladder it is often questionable whether it is better to drain or remove the gall-bladder. Drainage not only fails to relieve the cholecystitis but also further impairs the function of the gall-bladder. During the early years of antiseptic surgery there was a high mortality in gall-bladder diseases chiefly because of the ensuing complications, such as abscess of the liver, pancreatitis, perforation, and jaundice. Cholecystitis is now believed to be a primary condition. During 1919 at the Mayo Clinic 1,254 patients were operated on for cholelithiasis and cholecystitis. Seven hundred and fourteen (61 per cent) had stones and among these the operative mortality was 2.2 per cent. In 490 cases of cholecystitis





Gall-bladder freed on left side and duct divided. Dissection to be continued along dotted line.

without stones the operative mortality was 2.4 per cent.

Bacteria have been demonstrated in the bile, in gall-stones, and in the wall of the gall-bladder. They may reach the gall-bladder through the portal circulation, the lymphatics, or the biliary ducts. The gall-bladder serves as a storage place for bile and empties itself with the relaxation of the sphincter of Oddi which is located at the lower end of the common bile duct. Because of the manner

in which the common duct traverses the duodenum, regurgitation of bile is prevented.

Rosenow has demonstrated the localizing power of bacteria in the gall-bladder, and Mann has recently shown that the intravenous injection of Dakin's solution will cause a specific chemical cholecystitis. Cholecystitis without stones occurs twice as often in women as in men. Gall-stones occur in about 77 per cent of females as compared with 23 per cent of males, and 90 per cent of the



women so affected have borne children. The cholesterol content of the blood is higher during pregnancy.

The pancreas is usually infected secondarily from the gall-bladder by way of the ducts, the lymphatics, or, as is most frequent, the blood stream. Of the 1,254 patients with gall-stones and cholecystitis, 339 had clinical evidence of gross pancreatic disease. In cases of gross lesion of the pancreas accompanied by jaundice, distention of the gall-bladder, and marked cholecystitis, the gall-bladder may be drained externally over a long period of time or a cholecystenterostomy or cholecystgastrostomy may be performed.

Previous to 1910, 350 cholecystostomies were performed, 3 per cent of which were for cancer of the biliary passages and the remainder for cholecystitis with or without stones. Cholecystectomy was performed only in advanced cases. From January, 1907, to August, 1920, 11,429 operations on the gall-bladder were performed; of these 7,688 were cholecystectomies, and 3,346 were cholecystostomies. Of 2,027 operations on the gall-bladder and ducts performed during 1917 and 1918, 219 were secondary. In 109 of these, calculi were found. In only 64 of these cases was the primary operation performed at the Mayo Clinic. The author believes that the more frequent performance of cholecystectomy has reduced the number of secondary operations.

Enlargement of the lymph glands about the common duct and the head of the pancreas indicates pancreatic and biliary disease.

In performing cholecystectomy (see fig.) the author prefers a right oblique incision slanting through the muscle fibers. The gall-bladder may be better exposed by placing a large gauze square to the right and above the liver as advocated by Masson. The cystic duct is isolated, clamped between two forceps, and divided. The cystic artery is ligated separately. The gall-bladder fossa is closed by an interlocking catgut suture. Drainage is generally not employed, but in some cases the strands of catgut which are used to close the gall-bladder fossa are brought out of the wound. If retention takes place, forceps may be passed along the strand of catgut into the abdomen. If by the fourth day the catgut is no longer necessary it may be cut off beneath the skin. The avoidance of drainage has reduced the number of cases of postoperative hernia.

Distended gall-bladders may be emptied by means of a trocar, and in cases of acute inflammation they may be split from top to bottom.

The patient should be given a careful general examination before operation, and at operation an exploration should be made to determine the presence of other disease.

A definite cure occurs in about 60 per cent of cases and great improvement results in 30 per cent. In 10 per cent the improvement is less because of the extent of the disease or complications.

J. A. H. MAGOUN, JR.

**Adler, F. H.: Carcinoma of the Pancreas with Ulceration into the Gastro-Intestinal Tract.**  
*J. Am. Med. Ass.*, 1921, lxxvi, 158.

Carcinoma of the pancreas is usually recognized by its effects on adjoining structures due either to pressure, as in cases of common bile duct obstruction, or to direct extension of the malignant process. As a result of involvement of the gastro-intestinal tract ulceration sometimes occurs, but this is rare. The pathognomonic signs and symptoms arising from the pancreas itself are far less frequent than most textbooks would lead us to believe.

Ulceration of the abdominal viscera by pancreatic carcinoma is of frequent occurrence. Adler reports a case illustrating this complication.

The patient, a male aged 63, entered the hospital with the chief complaint of pain in the stomach. Five weeks before he was suddenly seized with severe abdominal pain of a colicky nature located in the hypogastrium. This pain lasted for two hours and required morphine for its relief. Subsequently a burning pain developed in the epigastrium and persisted constantly.

Abdominal examination showed tenderness over the gall-bladder region; no masses were felt. A tentative diagnosis of empyema of the gall-bladder with gall-stones was made.

It was believed that the patient's general condition precluded operation and he was therefore given medical treatment. His condition remained about the same as on admission save for increasing loss of flesh and strength. About a month later he vomited a large quantity of blood early in the morning. This was repeated three or four times. By afternoon the vomiting had ceased but the patient continued to grow progressively weaker and death occurred that evening.

At necropsy no free fluid was found in the peritoneal cavity and the peritoneum was smooth and glistening. The thorax was negative. The heart showed marked cloudy swelling and interstitial fibrosis. There was chronic perisplenitis with fibrosis and passive congestion. The kidneys exhibited a chronic parenchymatous nephritis. The liver showed cloudy swelling with slight fatty infiltration. The posterior wall of the stomach was adherent to a large ulcerating mass, but not infiltrated by it. The duodenum contained large quantities of brownish, bloody fluid. The lower part of the duodenum was firmly adherent to a large mass apparently arising from the head of the pancreas which appeared to have eroded into the duodenum just below its curvature at the head of the pancreas. The head and anterior half of the body of the pancreas were transformed into a huge, necrotic, foul-smelling mass measuring 15 cm. in its greatest diameter. This mass was firmly attached to the posterior wall of the stomach and the lower part of the duodenum and transverse colon. The lower pole of the spleen and the under-surface of the diaphragm were also adherent. In the middle portion of the transverse colon two large openings were



found, the larger one about 3 cm., and the smaller 1.5 cm., in diameter. The openings of the intestine connected with the ragged ulcerating mass. In the center of this mass was a cavity in which blood clots and necrotic material lay free.

The gross diagnosis was "ulcerating cancer of the head of the pancreas with erosion into the transverse colon and probably erosion into the lower portion of the duodenum; adhesions of the cancer to the posterior wall of the stomach and transverse colon, and probably erosion into the lower portion of the duodenum; adhesions of the cancer to the posterior wall of the stomach, the transverse colon, the lower part of the duodenum, the pole of the spleen, and the peritoneal surface of the right diaphragm."

The histologic examination disclosed a primary carcinoma of the pancreas, medullary in type.

M. I. MALONEY.

**Moynihan, B.: The Bradshaw Lecture (Abridged) on the Surgery of the Spleen.** *Lancet*, 1921, cc, 157.

The pathologic changes found in the spleen may be grouped best according to the affinities between the causative agents and the various parts of the spleen-liver system which they directly affect.

1. In the first type the provocative agent excites either a mechanical effect or a local lesion of the exact kind produced in other organs.

2. In the second type an organism lodges firmly in the pulp of the spleen without actually producing a gross lesion. The best example of this condition is afforded by the chronic malarial spleen.

3. The third type of process is that which is set up by toxic substances reaching the spleen from some nidus elsewhere in the body. Especially in the examination of the dead body, foci are easily overlooked in the mucosa or submucosa of the alimentary canal, in which there is no frank supuration but merely a subacute inflammatory cell infiltration of slight or moderate extent.

Given the primary infected lesion, the selective power of streptococci shown by Rosenow and of toxins is recognized. The poison may remain in the blood stream and act on the floating cells; in the spleen and liver it may produce either degenerative or reactive changes. In the liver the reactive change is the beginning of cirrhosis.

Another series of changes considered are those occurring when the brunt of the action of the poisonous substances is borne by the hepatic cell itself. Their effect on the bile channel or its endothelial lining may result in cholangitis. The effect of the poisoned blood on the bone marrow causing repression of function results in a certain type of anæmia or an increase or decrease in the leucocytes.

The toxins which may enter or leave the spleen are grouped according to their supposed actions as follows:

1. The most active poisons which cause anæmia ("anæmizing"); these prevent the formation of red blood cells.

2. The hæmolyzing poisons which play the chief part in hæmolytic splenomegaly.

3. Poisons which excite fibrosis; these are very common.

4. Poisons which excite cell proliferation; these may concern the cells of the malpighian bodies, as in lymphatic leukæmia and some kinds of Hodgkin's disease, or the cells of the spleen pulp.

Anæmia may be caused by many diseases. When hæmolysis is associated with anæmia, a disease of the spleen is to be suspected. Fragility of the red cells does not indicate, however, that the seat of the disease in which it occurs is in the spleen. Moreover, every anæmia associated with disorders of the spleen is not characterized by hæmolysis.

A second group of anæmias are those in which the initial disorder is either in the bone marrow or dependent on the same cause as that which affects the bone marrow. The clinical phenomena due to hæmolysis are absent in diseases in which the liver cell is equal to its work and does not suffer impairment, that is, in Hodgkin's disease, myeloid and lymphatic leukæmia, sarcoma of the spleen, and lymphogranuloma.

When jaundice arises as the result of a toxic process in the spleen-liver system, consideration must be given to: (1) the site of action of the poison, and (2) the nature of the poison. The liver cells and their relation to splenic anæmia and hæmolytic splenomegaly are discussed in detail. The absence of jaundice and the successive steps in the cycle of the metabolism of hæmoglobin between the spleen and liver in both normal and disease conditions are fully described. The rôle the pancreas plays in the production of cirrhosis is also considered.

Petechial hæmorrhage is occasionally seen in cases of splenic disease, leukæmia, and von Jaksch's disease.

Muscular weakness may be due to actual wasting of the muscle. The question arises as to the extent to which the phenomena of muscular weakness and asthenia are to be attributed to a direct action upon the adrenal or thyroid glands.

Pyrexia as a feature of splenic disease has only recently attracted close attention. It is almost constant in Hodgkin's disease. In pernicious anæmia periods of pyrexia are followed by apyrexial phases. In hæmolytic jaundice fever occurs periodically and in cholangitis the "steeple" chart is characteristic.

When the spleen is found to be enlarged on clinical examination it is certainly at least twice its normal bulk. The very largest spleen is found in Gaucher's disease, the next largest in leukæmia, and the next in malaria. In Hodgkin's disease the spleen may be involved without being clinically enlarged.

It is not sufficient in any case of leucocytosis to determine merely the presence of an increase in the number of white cells. It is necessary also to ascertain which varieties of cells are represented in the increase and to know the significance of each specific increase.



During recent years the suggestion has been made that the spleen may be concerned in some degree with the life-history of blood platelets. After splenectomy the normal conditions are restored. The clinical symptoms disappear as the number of platelets is increased.

Percy was able to show evidence of foci of infection in 95 per cent of cases. The chief organisms found were the hæmolytic streptococcus, bacillus coli, and streptococcus veridans.

Largely due to the work of W. J. Mayo and Percy a wider view has been taken with regard to the requirements in these cases and the improvement in the results has been decided. Percy emphasizes the importance of:

1. An attempt to stimulate the production of new blood by massive "step-ladder" transfusions of whole blood.

2. An attempt to overcome the absorption of hæmolytic bacteria or their toxins by the radical removal of local foci of infection.

3. An attempt to protect the newly formed and older red cells by removing the spleen.

The results of splenectomy in cases of pernicious anæmia performed by W. J. Mayo up to September, 1920, are quoted by the author. There were 53 cases with 3 deaths, a mortality of 5.6 per cent. Five patients were living between four and five years after the operation and 11 patients were living between three and four years after the operation. Twenty-two per cent of the patients lived two and one-half times as long as the average.

The steps mentioned by Percy are useless in the aplastic type of anæmia and of little value, if any, when cerebral and spinal symptoms are already present. If the anæmia is profound, however, transfusion alone may give some degree of transient benefit. In other cases of pernicious anæmia, operation is indicated.

J. E. STREUTERS.

**Hamilton, C. S., and Boyer, E. H.: Hæmorrhagic Cysts of the Spleen.** *Ann. Surg.*, 1921, lxxiii, 58.

Splenic cysts may be classified as: (1) dermoid cysts, (2) echinococcus cysts, and (3) simple unilocular or multilocular cysts: (a) serous, (b) hæmorrhagic, (c) lymph or chylous cysts. About 65 per cent of such cysts are found in females.

Peritoneal endothelium included in the spleen capsule may soften, degenerate, and liquefy, thus giving rise to cysts. Because of the absence of secretory glands true retention cysts are not possible. Trauma and disease conditions of the vessel walls cause hæmorrhage. Simple cysts may be caused by occlusion of arterioles with subsequent destruction and liquefaction of the pulp.

The lymph cysts are usually multiple and of small size while hæmorrhagic cysts are usually large and single. They may be located in any part of the organ, but are found most frequently in the anterior portion, low down, in or under the capsule. In some cases the cyst walls are thickened and calcified. Adhesions are frequently formed, and these may

render operative procedure more difficult. The weight of the cyst may be great enough to produce considerable transposition, a fact to be considered in the diagnosis.

Small cysts seldom cause symptoms. The larger ones give rise to symptoms by exerting pressure and traction. Disturbances of function are common; there may be a feeling of fullness, and tenderness, and respiratory, digestive, and urinary abnormalities. Pain may develop if perisplenitis is present, if the organ is transposed, or if there is a sudden increase in the size of the cyst; otherwise it is absent or negligible.

The diagnosis may be made by: (1) the discovery of a fluctuating tumor which is definitely related to the spleen; (2) by aspiration. Examination of the aspirated fluid may be sufficient to establish the diagnosis. In some cases the true nature of the lesion will be revealed only by an exploratory laparotomy.

It is necessary to differentiate splenic cysts from cysts of the kidney, ovary, liver, and pancreas, hydronephrosis, true neoplasms, and inflammatory overgrowths in the upper left quadrant. A pre-operative diagnosis has rarely been made.

Bircher gives the results of operation in 33 cases as follows: puncture by cautery, 6 cases, 2 deaths; incision and drainage, 9 cases, 1 death (sepsis); resection of cyst, 4 cases, 1 death; splenectomy, 15 cases, no deaths.

The authors report 2 cases of hæmorrhagic cysts occurring in girls 12 years of age. Removal of the cyst was followed by recovery in both cases. The microscopic diagnosis was hæmorrhagic cyst of the spleen.

G. W. HOCHREIN.

**Pfanner, W.: A Clinical and Experimental Contribution to the Pathology and Treatment of Injuries of the Spleen** (Klinischer und experimenteller Beitrag zur Pathologie und Therapie der Milzverletzungen). *Arch. f. Orthop.*, 1920, xviii, 206.

On the basis of the entire literature, injuries of the spleen may be classified as subcutaneous and open, and the subcutaneous into subcapsular and penetrating. Experimental evidence points to the fact that injuries of the spleen heal by means of connective tissue, and that this material is furnished by the capsule. Spontaneous cure in human beings has been revealed by the scar in only 3 positive cases. Subcapsular injuries may heal spontaneously under certain conditions, but *in vivo* the positive proof of rupture is often lacking. As a result of subcapsular injuries secondary rupture often occurs suddenly with the entrance of free blood into the abdominal cavity and the usual signs of peritoneal irritation developing, as a rule, after three or four days. The longest interval was fourteen days.

When hæmorrhages of the first and second types are not evacuated cysts are often formed which have walls but no epithelial lining. This fact is of significance in the differential diagnosis. Such cysts



constitute an area of lowered resistance for later infection or secondary hæmorrhage. Omis and Weichert have studied such cases bacteriologically. Kuettner showed anatomically that an abscess of this kind may become subphrenic or pleuritic.

By the entrance of infection into a splenic injury a very serious situation arises which can be benefited only by early surgical treatment. Compound and capsule-involving injuries of the spleen, if untreated, lead to severe hæmorrhage and shock; death frequently results from shock passing over into anæmia. In such cases also life can be saved only by immediate surgical intervention with extirpation of the organ. Even if the patient survives the primary hæmorrhage without treatment he will usually succumb to secondary hæmorrhage following rupture of the peritoneal adhesions.

The symptoms of secondary hæmorrhage or secondary rupture are those of severe peritoneal irritation. Therefore surgical intervention is, and will remain, the method of choice in the treatment of rupture of the spleen. WEICHERT (Z).

### MISCELLANEOUS

**Jackson, C., and Spencer, W. H.: Safety Pins in the Stomach: Peroral Gastroscopic Removal without Anæsthesia.** *J. Am. M. Ass.*, 1921, lxxvi, 577.

In Case 1 two safety pins were removed from the stomach of a 6-months-old infant after a period of twenty-seven days. In Case 2 an open safety pin lay in the stomach for seven weeks, after which it was regurgitated into the œsophagus and removed by œsophagoscopy. The authors' conclusions are as follows:

1. In most cases foreign bodies which have reached the stomach spontaneously (without being pushed down) will pass out harmlessly through the intestinal tract.

2. There are a sufficient number of exceptions to this rule to render it imperative to have the foreign body watched by a skilled fluoroscopist at frequent intervals until it is recovered from the stools.

3. During the watchful period no change from the usual diet should be made and laxatives should not be given.

4. Instances have been known in which an open safety pin has passed the rectum, but in view of the cases reported in this article, removal from the stomach is advisable when the pin is of such large size relative to the size of the patient that it probably will not pass and when a watchful waiting period of a number of weeks (from three to eight) has demonstrated that it probably will not pass.

5. Regurgitation of a foreign body from the stomach is so exceedingly rare that it is not to be awaited.

6. The safest and best method of removing foreign bodies from the stomach is by peroral gastroscopy by an experienced endoscopist. Otherwise, operation by a skillful surgeon is safer and more successful. No anæsthetic, general or local, is necessary for gastroscopy. When, in the case of an insane person, a large number of foreign bodies are present in the stomach operation is the preferable method of removal.

7. The aid of a skillful roentgenologist is imperative in the study of these cases.

8. According to the experience of the bronchoscopic clinic, the foregoing principles apply to foreign bodies other than safety pins. E. C. ROBITSHEK.

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Meyer, A. W.: Unrecognized Occupational Destruction of the Tendon of the Long Head of the Biceps Brachii.** *Arch. Surg.*, 1921, li, 130.

In 1915 Meyer reported 6 cases of destruction of the tendon of the long head of the biceps discovered in the course of anatomical dissections. Since that time 7 additional cases have been observed. The latter are described in this article.

The fact that the disappearance of the tendon is not due to disuse was fully established by an examination of the same tendons in a woman over 40 years of age who had been affected with congenital hydrocephalus. This woman was partly paralyzed from birth, but although the right humeroscapular articulation had been practically immobilized because of fibrous ankylosis, the tendon of the biceps could be traced in its entirety.

That friction is very largely, if not wholly, responsible for the condition is indicated by the fray-

ing and fringing of the other soft parts and of the tendon itself. It is surprising, however, that a tendon in a shoulder joint with cartilages wholly intact and with but a small capsular defect may be destroyed to such an extent when it is almost wholly free from adhesion to the capsule.

The uniformity and the very apparent significance of these findings led Meyer to consider the possibility of an occupational cause, although at first the destruction seemed too extensive to warrant such an assumption. It appeared to him that whatever the process responsible, it was extra-articular rather than intra-articular.

In the 13 specimens examined the destruction of the tendon was divided almost equally between the right and left arms. There was only 1 case in which both tendons were destroyed. G. W. HOCHREIN.

**Pfeiffer, D. B.: Acute Osteomyelitis in Children.** *Arch. Pediat.*, 1921, xxxviii, 32.

This article is based on 35 cases collected from the records of the Surgical Service of the University



Hospital, Philadelphia, covering a period of slightly more than ten years.

There were 14 males and 11 females. The ages of the patients varied from 16 months to 15 years. The average age was 10 years, 1 month.

As a rule the focus of this disease is found in the long bones but it may involve any bone with a spongy medulla.

In considering the etiology of osteomyelitis, one must speak in terms of infection and immunity. In the cases reviewed the most common infecting micro-organism was the staphylococcus aureus. In 2 cases the streptococcus was found alone, and in 1 both the streptococcus and staphylococcus aureus were present.

As in many other infectious diseases, weakening of the protective forces of the body plays a considerable rôle in predisposing to the attack.

In about one-third of the cases there were definite suggestions as to the portal of entry. It is obvious that osteomyelitis is a hæmatogenous infection. It is equally certain, therefore, that bacteræmia must precede localization. The source of the bacteria in many cases may be surmised very accurately. Antecedent conditions of apparent importance are tonsillitis, pharyngitis, and other oral infections, bronchitis, influenza, pneumonia, gastric and enteric disturbances, helminthiasis, pustular conditions of the skin, and minor infections of traumatic origin.

In 15 of the cases reviewed a history of trauma was given. Trauma acts by causing internal injury of the bone. A force of sufficient violence applied to a bone breaks the dense cortical layer and produces a fracture. A force of insufficient violence to produce fracture may yet injure that marvellous system of arches and cross-braces which gives to the spongy bones their strength combined with lightness. During the period of growth the bone immediately adjacent to the epiphyseal cartilages is young and delicate and most susceptible to trauma. It is well known that in the vast majority of cases acute osteomyelitis begins in the shaft of a long bone near the epiphyseal plate, a region known as the metaphysis. Occasionally the epiphysis is the seat of the primary lesion. Formerly, typical osteomyelitis was often called "epiphysitis" under the impression that the epiphysis was the primary focus, a natural error due to the location of the infection at the end of the bone. True epiphysitis, however, tends to extend into the joint rather than into the shaft.

Another point of interest in connection with true acute epiphysitis is the fact that the "chain" cocci, the streptococcus and the pneumococcus, appear to have a predilection for the epiphysis while staphylococcal infections in this location are considerably less frequent.

Ordinarily pain is the initial and most prominent early symptom of acute osteomyelitis, though constitutional evidences of infection are present and increase rapidly. Fever, rapid pulse, leucocytosis, chills, sweats, and other general symptoms of

pyogenic infection are the rule. Effusion is frequently noted in the neighboring joint. In a few days one or more fluctuating abscesses of the overlying soft parts may form and the inflammation often extends throughout the length of the bone.

The mortality in the author's series was 14.3 per cent. Excluding the cases in which death occurred, the average duration of treatment in the hospital was five months. In spite of this prolonged period, only 4 patients were discharged cured.

There is no disease of which it can be said more truly that the treatment is wholly surgical. The patient may be given medical treatment, but not the disease itself in the present limitations of antitoxic and antibacterial therapy. The essential object of early treatment is prompt and efficient drainage of the affected medulla. The surgical error frequently committed at operation in the acute stage is incision and drainage of the soft parts and the periosteum, the bone being left unopened. The bone should be opened in every case. In the case of the long bones it is best to remove the cortical bone over the medulla for a distance of 2 in. and, if microscopic evidence of infection still remains visible in the marrow, the incision should be carried beyond that point. The marrow should not be curetted away in the acute stage. If exposed freely, it will drain itself and necrosis will be limited to a minimum.

The opening made should be packed with paraffin gauze and, on removal of the pack between the third and the fifth day, Dakin's solution may be used advantageously to limit superficial infection and the absorption of toxic products.

With due allowance for individual resistance and the virulence of infection, the mortality and morbidity of this disease vary inversely with the promptness of diagnosis and treatment and directly with the efficiency of drainage at the primary operation.

M. I. MALONEY.

**Escher, A.: Sarcomata of the Bones of the Extremities** (Ueber die Sarkome der Extremitätenknochen) *Arch. f. klin. Chir.*, 1920, cxiv, 545.

Only extensive statistics can clear up certain important questions with regard to the prognosis and treatment of the different forms of sarcoma of the bones of the extremities. Isolated cases are reported only when the result is very favorable and therefore give an incorrect impression.

After quoting the different authors who have published large numbers of cases Escher discusses 63 cases which were treated at the first surgical clinic at Vienna from 1901 to 1918. Forty-four of the patients were males, and 19, females. Sarcoma of the bones of the extremities occurs most frequently in the third decade of life, next most frequently in the second decade, then in the fourth, and then in the first. In the cases reviewed the growth involved the lower extremities in 40 and the upper extremities in only 14. In the femur the lower third is involved most frequently, and in the humerus, the



upper third. The tibia and fibula are also most frequently attacked in the upper third. Trauma was given as the cause in 25 cases, but the patients' statements cannot be relied upon. Trauma is more probably the exciting factor causing more rapid growth of a tumor already present.

The age of the tumor is only to a certain degree an indication of its malignancy. Of 21 patients who died of sarcoma metastases, 19 died within one year of operation and 2 only after three years. Accordingly, freedom from recurrence for over three years may be considered a cure. Giant-cell sarcomata, on account of their relative benignancy, are in a special class. The perithelioma is also only slightly malignant. In 13 cases the periosteal origin, and in 23, the myelogenous origin, was definitely established.

Removal of a section for diagnosis is permissible only if after immediate diagnosis a radical operation can be performed. In spite of the great progress in X-ray therapy, roentgen treatment does not result in an actual cure in cases of bone sarcoma through it may be of benefit in inoperable cases. Coley's serum has proven of no value. In spite of the benignancy of the giant-cell sarcoma, a resection or, in particularly favorable cases, an enucleation, of the tumor is necessary as the minimal surgical procedure in order to obtain permanent healing. The one case of perithelioma in the series of cases reviewed healed after the second thorough curettage. Resection offers a chance of cure only when the sarcoma is recognized early, that is, when the tumor is still completely encapsulated. When a bone sarcoma already involves the soft parts conservative measures are useless. Of 10 patients treated by resection, 6 had recurrences, 2 died without recurrence, and 2 were permanently cured. Of 15 treated by amputation and enucleation, 3 had recurrences, 9 died without recurrence, and 3 were permanently cured.

In cases of sarcoma of the fingers and toes enucleation of the portion of the limb involved will generally effect a cure. In cases of sarcoma of the long bones, myelogenous and periosteal, the radical operation must be considered as the only effective method. Case histories and references to the literature are given.

KAERGER (Z).

**Razzaboni, G.: The Radical Operative Treatment of Primary Epithelioma of the Fingers** (Sul trattamento operativo radicale degli epiteliomi primitivi delle dita della mano). *Chir. d. organi di movimento*, 1920, iv, 511.

Epithelioma of the fingers is no exception to the general physiopathologic laws which govern the diffusion of blastomatous elements along the lymphatic routes. Therefore in any operative procedure aimed at its radical treatment care must be taken to adhere strictly to these laws and to remove as thoroughly as possible all tissues actually infiltrated as in the radical treatment of cancers of the breast, uterus, tongue, etc.

The author describes the lymphatic connections of each of the fingers in detail. The deep and superficial lymphatics are relatively independent. The deep lymphatics of the fingers are almost exclusively tributary to the axillary lymphatic glands, while the superficial lymphatics are at least to a great extent dependent on the epitrochlear glands.

The lymphatics of the fingers are associated with three systems, viz., the supra-epitrochlear, the axillary, and the supraclavicular. Therefore in the radical treatment of cancer it is necessary to remove the affected lymphatics in these regions.

In a case described Razzaboni made a lozenge-shaped incision circumscribing the inferior margin of the great pectoral muscle and a second incision perpendicular to the first and extending from its medial branch to the center of the supraclavicular fossa. The two pectoral muscles and a neoplastic mass in the axilla, which was evidently a metastasis of an epithelioma of the right thumb, were then removed and the axillary fossa was systematically cleared out. The clavicle was resected in its middle third so as better to expose the neurovascular fascia and the corresponding supraclavicular fossa. All the infiltrated lymphatic glands, especially those below the clavicle, were removed. This was followed by osteosynthesis of the clavicle and suture of the soft parts. A linear incision was then made along the anterior surface of the elbow and the supra-epitrochlear glands were removed. The thumb was amputated in the metacarpophalangeal articulation.

The postoperative course was normal. The patient made a good recovery and was able to resume his occupation to some extent. Several months later, however, he died of complications due to influenza. Therefore the permanent value of the operative treatment cannot be stated.

W. A. BRENNAN.

**Roderick, H. B.: Legg's or Perthes' Disease; The Differential Diagnosis of Affections at the Hip in Children.** *Lancet*, 1921, cc, 210.

The differential diagnosis of affections of the hip in children is discussed in detail. The X-ray has given valuable assistance in the diagnosis of tuberculosis which is the most common condition. Reliance cannot be placed on it alone, however, and therefore a careful and methodical physical examination is necessary. Emphasis is placed on the importance of co-operation between the surgeon and radiologist in order to differentiate tuberculosis, infective arthritis, and Legg's disease.

"Painless limp" is due to shortening of the limb, paralysis, or stiffening of a joint. The body inclines toward the affected side. In painful limp the patient stiffens the joints by muscular action. The weight placed on the affected side is decreased as much as possible by leaning toward the normal side.

At examination the patient should be stripped and his gait should be observed for limp. Obliteration of the gluteal fold indicates slight flexion of the hip and when associated with muscular wasting



indicates disease. With the patient lying down, the limbs should be measured and the curvature of the spine observed. Partial fixation of the joints by muscular spasm points to hip disease. Limitation of the joint in any direction is another important sign.

The adolescent type of arthritis deformans is often difficult to diagnose as it may resemble tuberculous disease and the X-ray evidence may be inconclusive. Detection of this disease in other joints may clear up the diagnosis. Among other conditions which may simulate tuberculosis of the hip are tuberculosis of the sacro-iliac spine, bursitis, psoas abscess, myelomata, and sarcomata. There are also non-traumatic deformities other than Legg's disease: (1) congenital dislocation of the hip, (2) infantile paralysis, (3) coxa vara, and (4) coxa adducta.

Perthes' or Legg's disease of the hip occurs in children between the ages of 3 and 12. Males are more often affected than females. On clinical examination some prominence and elevation of the trochanter and shortening of the limb may be noted. Bryant's triangle will show a correspondingly shortened base line. Flexion and extension are normal; internal rotation may be slightly limited, but abduction is markedly restricted. The condition is usually unilateral and associated with slight disability. There is no crepitation on movement or other sign of involvement of the articular surfaces.

The X-ray examination shows the femoral head as a flat surface instead of a segment of a circle. The epiphyseal line between the head and neck is irregular and segmented; light areas may be seen in the head and are supposed to be islets of cartilage indicating irregularity of ossification. The acetabulum may be blurred or irregular.

In a large percentage of the recorded cases a history of injury four to six months previously was given. Legg's disease may be noted after reduction of congenital hip disease. Hypothyroidism and infection of a protozoal nature have been suggested as causes. Evidence has been offered also which points toward syphilis as a predisposing condition.

Most surgeons agree that no treatment is indicated. However, it seems rational to fix the thigh in an abducted position by means of a plaster splint and then allow the child to go about on crutches with a patten under the sound foot during the acute stage.

MERLE R. HOON.

**Fairbank, H. A. T.: Pseudo-Coxalgia; Osteochondritis Deformans Juvenilis.** *Lancet*, 1921, cc, 20.

Pseudo-coxalgia is not generally known in England. The author describes a typical case as follows:

An apparently healthy child begins to limp. Some previous injury may be blamed, but generally it is one which would not account for the symptoms. There is little or no pain. Examination reveals that the limb at rest is usually in a normal position; slight wasting of the thigh and buttocks causes an apparent prominence of the trochanter; abduction



Tracing of skiagram of case of bilateral pseudo-coxalgia.

is markedly limited; flexion remains almost or quite free; shortening does not occur at this stage, and when it does develop later it is slight. There is no pain on jarring the joint.

The X-ray shows that the epiphysis of the head is flattened and irregular or even broken into pieces. The epiphyseal line is less distinct than normal, while nearby there may be semi-transparent areas. The neck is thickened on the lower side and the joint space is not diminished, showing that the changes are in the osseous center rather than in the cartilage of the femoral head. The affected side of the pelvis may be smaller and the acetabulum may show a lack of definition.

The progress of the case is toward recovery with eventual disappearance of the limp. Treatment or lack of treatment does not seem to affect the result. Abscesses do not occur. A walking caliper splint may be applied to take the weight from the femur. Little advises forceful abduction under anaesthesia in order to avoid any changes in the shape of the head which could limit abduction. Rest and extension for a time are advised when there is pain or spasm.

The favored theory as to the cause is that trauma produces damage to the blood supply of the head of the femur and the changes in ossification of the bone are secondary to this. Developmental error, local infection, and rickets have all been considered as etiological factors. Tuberculosis and syphilis can be ruled out. Similar epiphyseal changes as revealed by the X-ray are found elsewhere in the body.

H. T. JONES.

## FRACTURES AND DISLOCATIONS

**Orr, H. W.: The Treatment of Fractures.** *J. Orthop. Surg.*, 1921, n. s. iii, 23.

The author gives a brief résumé of the literature on this subject, emphasizing the fact that inefficient immobilization and too early mobilization are two of the principal factors responsible for poor results in the treatment of fractures.

In general, fractures in children and in adults should be treated by similar methods.

The most important agencies in the treatment of fractures of the femur and leg are the Thomas traction splint and plaster of Paris. The less the Thomas splint is modified, the more efficient it is. Leriche's work with plaster of Paris is highly commended.



For either open or closed fracture of the leg and fracture of the neck of the femur plaster of Paris is usually indicated.

In the treatment of fracture of the shaft of the femur the Thomas traction splint is far superior to all other mechanical devices, both as an emergency splint and for continuous treatment.

Skeletal traction is a justifiable addition to the Thomas splint in cases of fracture of the extreme lower end of the femur or the leg.

The Balkan frame and occasionally the Hodgen splint may be applied in extensive compound injuries of the thigh.

Moleskin plaster or adhesive glue must be used for traction. Elevation of the foot of the bed with the splint anchored at the lower end contributes to the traction and makes the wearing of the ring splint more comfortable.

The author advocates the elimination from our textbooks of Buck's extension, weight and pulley traction, the Ruth Maxwell method, Volkmann's sliding splint, the Liston splint, and similar and related methods and apparatus.

Stiffness, excess callus, adhesions, and ankylosis are all due to inefficient immobilization. The author is opposed to the early mobilization of joints near the site of fracture.

D. H. LEVINTHAL.

**Blake, J. A.: The Repair of Bone Following Fractures.** *Arch. Surg.*, 1921, ii, 37.

The author is of the opinion that the periosteum serves as a protector of developing bone but says little regarding its activity as a bone former.

The rate at which bone is formed is directly dependent on the blood supply. Even when detached, fragments of bone produce bone if the conditions are favorable. When sufficient infection is present to change the chemistry of the fluids about the fragments, all detached and anæmic portions usually die. Infection also produces hyperæmia in the adjacent structures which leads to the rapid formation of bone tissue. In this way excessive callus is produced.

Blake believes that when a portion of bone dies it preserves its original density, while the remaining living bone becomes softer and less dense because of absorption of its calcareous constituents. Fragments of detached bone are digested alive either by their own osteoclasts or by the fluids and cells in their environment. If they die *en masse*, infection is present and they are discharged with the formation of an abscess or sinus. Rarefaction depends more on disuse than on infection in fractured bones.

A fracture should be reduced as soon as possible. Repair in the sense of new bone formation does not go on indefinitely.

E. C. ROBITSHEK.

**Cutler, E. C.: Notes on the Non-Operative Treatment of Fractures.** *Ann. Surg.*, 1921, lxxiii, 91.

If there is any one branch of medicine in which the recent experience gained by observation of battle

casualties has been of distinct value it is that concerned with the care and treatment of fractures. This experience brought out certain principles which are applicable to fractures sustained in civil life, whether compound or simple. The chief lessons learned concerned the value of mobilization in the treatment of infected joints, and of traction in the care of fractures generally. In recent years, however, traction has been somewhat abandoned because of the brilliancy of a few operative reductions in which mechanical splinting was used and because of the general impression that immediate reduction and fixation in plaster give better results.

A further observation by no means new is that callus is malleable at late periods. Therefore if sufficient traction is used a fractured and badly deformed femur with visible callus formation and shortening may be pulled down to full length and given good alignment as late as three weeks or even longer after the receipt of the injury. Evidence of the elasticity and malleability of callus formation is presented by Sinclair, Blake, and Bowlby who have written that when patients with fractures of the femur were made ambulatory with splints twelve weeks after the injury considerable shortening of the limb resulted. Therefore in cases of fracture of the femur Sinclair makes allowance for from  $\frac{1}{2}$  to  $\frac{3}{4}$  in. of shortening before making the patients ambulatory.

Since this evidence is not thoroughly appreciated, it seemed to the author that examples of its application to civil surgery might be of some value in making the use and value of traction more widespread and in diminishing the number of open operative reductions in which the added risk of anæsthesia, sepsis, and mechanical failure are always present. It would seem merely the part of wisdom to try the simplest procedure first, especially when its efficacy is proved.

The author reports several cases in which, after callus formation was far advanced and associated with deformity, strong and continued traction without open operation gave a good anatomical result.

H. A. MCKNIGHT.

**Van der Elst, M.: The Treatment of Diaphyseal Fractures** (Le traitement des fractures diaphysaires). *Arch. méd. belges*, 1920, lxxiii, 824.

In the author's opinion the Putti-Parham method of encircling fractures with wire is not applicable to distinctly transverse fractures as it does not give sufficient solidity and the strangulation by the circular ligature may cut off the nutrition of the periosteum.

Van der Elst prefers a combination of the plate method with the encircling method of Putti-Ronvilon. He uses a plate of nicked steel, 6 cm. long, 6 mm. wide, and 5 mm. thick. The bone surface is roughened to prevent slipping. The external surface is grooved to receive the metal strips which fix it to the plate. In the external surface of the plate are three grooves to receive blunt screws and in one



end of the encircling metallic strip are several holes for use in tightening the strip. The plate is fixed on the fracture and encircled by three separate ligatures.

This modification gives solidity without penetration of the bone by screws, and the interrupted encircling of the periosteum prevents strangulation.

W. A. BRENNAN.

**De Francesco, D.: Rotation of the Fragments in Humeral Fractures** (Della rotazione dei frammenti nelle fratture dell'omero). *Chir. d. organi di movimento*, 1920, iv, 565.

De Francesco discusses the action of the muscles in humeral fracture, the anatomy and physiology of the humerus, the movements of the fractured humerus, the normal position, and the relation of fractures to the insertion of the muscles. The conclusions drawn are summarized as follows:

1. In a diaphyseal fracture beneath the insertion of the pectoral muscle the upper fragment remains in the position of normal rotation as in the normal limb in the position of repose.

2. The lower part falls vertically by its own weight.

3. In the correct position of the fragments the epicondyle should lie perpendicularly under the acromion and at least at the same distance as on the normal side.

4. The bicondylar and bicipital axes should make an angle of 55 degrees with each other as on the normal side.

On the basis of anatomical and physiological study it seems evident that the humerus has a special rotation in its normal movements and maintains it also when fractured except that in some cases the rotations may be greater because of the break in the continuity of the bone.

With regard to the rotation of the fragments, fractures may be divided into two classes according to whether they occur within or beneath the insertion of the pectoral muscle. In the first case the apparatus must effect high abduction or vertical elevation; such positions should be maintained by weight traction or by a plaster cast. After operative intervention for high fractures such positions are to be preferred as they do not tend to displace the correct alignment of the fragments.

In median or low fractures any position is good provided it maintains normal rotation. The selection of the position should be based on the patient's age, the state of the skin, the muscular development, etc. There is no one apparatus suitable for all humeral fractures, but there are many types for a given fracture. The important point in the treatment is the preservation of the normal rotation of the limb.

W. A. BRENNAN.

**Speed, K.: The Treatment of Fracture of the Femur.** *Arch. Surg.*, 1921, ii, 45.

Speed has collected from the records of the Cook County Hospital, Chicago, for the last three years

the reports of 526 cases of fracture of the femur which were under observation for some time. Four of the series were compound fractures.

Three hundred and twenty-eight of the patients were males, and 198, females. The right femur was affected in 271 cases; the left, in 255.

The total deaths of the series numbered 56 (11 per cent). Twenty-two deaths were attributed to pneumonia complicating the fracture. Other causes of death were multiple fracture, nephritis, myocarditis, infection, and lung abscess.

The methods of treatment employed were: rest in bed, the use of sand bags, supporting the patient in the sitting posture in bed with pillows, etc., in 35 cases; the application of the Thomas splint with suspension traction in 25 cases; vertical extension in the cases of children in 56 cases; Buck's extension sometimes combined with the use of Liston's splint, a double inclined plane, and molded plaster-of-Paris splints, in 97 cases; the use of the fracture table, extension, and a cast in 113 cases (21 per cent); and the application of splints of plaster and wood in 8 cases. In regard to 192 cases (36 per cent) the treatment is not stated.

The results when the patients were discharged from the hospital are summarized as follows: shortening,  $\frac{1}{2}$  to  $2\frac{1}{2}$  in., 101 cases; left hospital on crutches, 189 cases; left hospital in cast, 39 cases; able to walk, 51 cases; and non-union (questionable), 6 cases. In 240 case records (47 per cent) the condition at the time of discharge from the hospital is not stated.

The total number of operations performed to reduce these fractures was 51. The total number of deaths following operative interference was 4 (about 8 per cent). In order to improve the results, Speed makes the following suggestions for standard treatment:

The patient with a fractured femur should be treated in a hospital. The fracture should be examined with the X-ray, reduced, and splinted at once so that extensive muscle infiltration and contraction will be prevented. The distal bone fragment over which the surgeon has control must be brought into a plane of normal relationship to the proximal fragment.

Fractures of the neck of the femur in childhood are frequently only epiphyseal separations with little displacement. The causative trauma may be overlooked and gradual displacement due to the change in the angle of the femoral neck and shortening frequently follow as the patient bears weight on the injured leg. The gradual displacement of the shaft upward is associated with a process of repair. Therefore if the diagnosis is not made early, the neck may be molded after several weeks into a firm bony mass and an open operation will be necessary to effect reduction.

If the fresh fracture has resulted in complete separation, either through the epiphyseal line of the neck or at the base of the neck, the shaft is usually moved upward, backward, and outward. Hence



to reduce the fracture, the distal portion of the limb over which the surgeon has control must be lifted forward, rotated inward, and then drawn to normal length. This should be followed by abduction to the limit so that the greater trochanter is opposed to the rim of the acetabulum and the side of the pelvis and the neck is brought into alignment and contact with the head, aided partly by the capsular ligament and the resistance of the head against the acetabulum. While the leg is in extreme abduction the patient should be placed in a plaster of Paris cast extending from the nipples to the toes. This should be kept on for from eight to twelve weeks. Weight should not be borne on the limb for from three to six months thereafter.

The same treatment is applicable to fractures of the neck of the femur in adults, whether impacted or not, unless the patient's physical condition prevents active treatment.

In old fractures in adults it may be difficult to maintain bony contact. Consequently, to secure bony union it has been considered best to introduce a bone peg through the trochanteric region in the head while the limb is in a position of extreme abduction.

Probably not more than 15 per cent of fractures of the neck of the femur in adults result in bony union unless treatment by extreme abduction is given.

The most common deformity requiring treatment after vicious union of fractures of the neck of the femur is *coxa vara*. For such cases an osteotomy alone promises a better result.

Ununited fractures of the neck of the femur demand treatment when the patient desires to be relieved of the resulting disability. Speed believes that in suitable cases any method which will freshen the fractured surfaces and maintain them in apposition is sufficient. In his opinion the value of the autogenous bone peg inserted through the neck into the head has been overrated.

When the neck fragment has been absorbed by use and improper treatment and when the head is atrophied so that only the articular portion which does not project beyond the acetabular margin remains, it is difficult to bring the fragments into apposition. In cases in which there has not been great absorption of the neck, Speed's treatment is as follows:

The fragments are freshened through an anterior incision and an autogenous bone peg is then inserted from the trochanter into the head while traction is maintained and the extremity is abducted and rotated inward. When the patient is over 50 years of age and there is less probability of obtaining bony union of the head to the neck it is better to produce an ankylosed hip by driving the bone peg clear into the pelvis.

Most intertrochanteric fractures are due to direct violence. The plane of fracture runs diagonally from one trochanter to another, and either or both trochanters may be broken off and separated. Traction will easily restore full length, and the swing-

ing of the limb outward to full abduction restores the neck angle. A plaster of Paris cast applied while the patient is on the fracture table in this position gives excellent results. If there is impaction and it is impossible to confine the patient to bed, sand bags or pillows and a sitting position will frequently give a satisfactory result but there will be some shortening.

Statistics show a higher mortality from intertrochanteric fractures than from fractures of the neck of the femur and the author therefore advises great care of the heart and lungs in such cases.

Fractures of the trochanters alone do not often demand unusual treatment. If the greater trochanter is widely separated by the attached muscles, it may be pegged to the rest of the bone and the leg immobilized in abduction. Usually abduction or rest in bed for two or three weeks results in a useful leg.

In cases of subtrochanteric fracture the best method of treatment is continuous suspension traction with the Hodgen or Thomas splint bent at the knee.

The most common site of fractures of the shaft of the femur at any age is the middle third of the diaphysis. In the treatment the aim is to restore length by approximating the end of the fragments and to maintain a normal limb axis in both a horizontal and longitudinal plane.

The use of plaster casts for fractures of the shaft of the femur, except in cases of green-stick or incomplete fracture with little displacement, should be discarded. In the cases of children the best results are obtained by suspension traction treatment.

In cases of supracondylar fractures the treatment must be prompt. When the fracture is incomplete or a green-stick fracture and when there is only slight displacement, extension on a fracture table with pressure of the fragments back into line, followed by the application of a molded plaster splint for four weeks, will give good results.

Bicondylar, T, and Y fractures of the knee joint are treated best by strong continuous extension in semiflexion. Manual pressure on the fragments may aid the reduction. When this fails, an open operation is necessary and should be performed within eight days. These are true articular fractures and the operation is an arthrotomy.

Two methods of approach are offered. The best approach is obtained by sawing the patella longitudinally and retracting the extensor mass over the femoral condyles. The fragments should then be brought together and maintained in contact by means of an ivory screw or nail driven in laterally. The joint should be carefully and completely closed. The other approach is obtained through a large U-shaped incision extending to just below the tibial tubercle so that the insertion of the patellar tendon can be chiseled free and the joint exposed.

For condylar fractures the best treatment is continuous extension in a straight line aided by



manual pressure. Semiflexion has failed in the author's cases.

Speed's conclusions from this study are as follows:

1. Because there is no accepted American standard of results following fracture of the femur, there is no American standard of treatment.

2. A large percentage of fractured femurs are cared for by the first physician who sees them; specialists are not employed to direct the treatment.

3. Not sufficient use is made of abduction or suspension traction such as is obtained by the Hodgen or Thomas splint in fractures of the shaft and allows knee motion during the course of bone repair without disturbing the extension.

4. Portable roentgen-ray outfits should be furnished all hospitals treating fractures of the femur so that the results of treatment can be checked as frequently as desired.

5. There have been too many operations performed on fractured femurs by inexperienced operators and without proper indications.

6. Very little attention is given to massage and electrical stimulation of the muscles during bone repair and still less to the after-treatment. Therefore many patients are permitted to bear weight on a soft callus and disability results. Walking calipers are little used.

7. Every patient with a fracture of the femur should be directed to a hospital for roentgen-ray examination, correct treatment by any of the accepted methods, and after-treatment. The after-treatment includes fitting him with a walking caliper as soon as he is able to walk or on his discharge from the hospital.

8. As fracture tables are of aid in the reduction of a fracture and in external splinting with plaster of Paris, every hospital receiving cases of fracture of the femur should possess such a table. Careful records should be kept on a fracture record sheet such as has been compiled by the American Surgical Association so that a large number of average results may be grouped and treatment looking toward the ideal may be worked out.

G. W. HOCHREIN.

## **SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.**

**Albee, F. H.:** Restoration of Shoulder Function in Cases of Loss of the Head and Upper Portion of the Humerus. *Surg., Gynec. & Obst.*, 1921, xxxii, 1.

Loss of the head and upper part of the shaft of the humerus is not an infrequent occurrence. Such cases have been classified by the author into two groups with respect to surgical treatment: Group 1, those in which the injury to the muscles is not so great as to prevent the reconstruction of a movable and functioning shoulder joint; and Group 2, those in which it is impossible to restore motion and function. Group 1 is further subdivided into cases in

which the individual muscles may be used, and those in which motion may be obtained by reconstructing the muscles in groups.

The author reports 4 cases operated upon. The first belongs to Group 1a, the second and third to Group 1b; and the fourth to Group 2.

In Case 1 it was necessary to remove the upper  $4\frac{1}{2}$  in. of the humerus because of giant-cell sarcoma. This was replaced at the same operation by the head and upper 4 in. of the fibula which was reamed and driven firmly into the marrow cavity of the humerus. The capsule was then replaced and the muscles properly inserted by means of kangaroo-tendon ligatures through drill holes. A shoulder spica was applied for twelve weeks. At the end of this time the X-ray showed firm union of the graft. Subsequently there was rapid development of function. Six months after the operation the patient slipped and by reaching out for support fractured the graft. A spica was again applied for twelve weeks. On its removal the X-ray showed a firm splinting callus about the fracture. Function rapidly increased and after eighteen months there was no recurrence of the sarcoma.

Case 2 was similar to Case 1 except that the deficiency of the head of the humerus resulted from non-union of a fracture with subsequent infection and removal of the upper 4 in. The patient was a professional pianist. It was necessary to attach the muscles *en masse* upon the head of the transplanted fibula. Eleven months after the operation the return of function was so marked that she was able to continue her professional work.

In Case 3, that of a soldier, there was total loss of the upper portion of the humerus caused by fragments from a high explosive shell. A transplant of the head and part of the shaft of the fibula was made and after two months good bone proliferation was found. Vocational training played a decided part in the recovery. After fourteen months the patient was able to return to his machine shop and the X-ray showed the arm to be strong and stable.

In Case 4 the destruction of the muscles, due to the original injury caused by a high explosive shell and subsequent infection and operations, was so extensive that the restoration of motion in the shoulder joint was out of the question. It was necessary to look to the scapulothoracic muscles for the propelling power. In this case the author devised a T-shaped graft to form an ankylosis of the humerus with the scapula. The acromion process was mortised, the glenoid cavity denuded and mortised, and a tunnel then made in the humerus. A large graft  $1\frac{1}{2}$  by 8 in. was taken from the anterior internal surface of the tibia and divided into a larger and smaller graft. One end of the larger graft was placed in the mortise of the acromion and the other in the tunnel in the humerus. The smaller graft was placed in the mortise of the glenoid cavity and fastened at one end with kangaroo-tendon to the first graft to reinforce it. The arm was immobilized by a plaster spica for twelve weeks; at the end of



this time the X-ray showed a considerable amount of newly formed bone. Functional improvement was rapid until five months after the operation when the patient attempted to lift a weight over 150 lbs. and fractured both grafts. Operation was performed immediately and thin grafts were placed along the points of fracture. A spica was worn for four weeks. Four months later a considerable degree of function had returned, but the ultimate outcome of the case was made questionable by the fracture.

In summing up, the author states that in his opinion the old posture used in the treatment of fracture of the upper part of the humerus should be abandoned because of the uncalculated action of the supraspinatus and subscapularis muscles which place the fractured surface of the upper fragment anteriorly so that the lower fragment often comes in contact with the slippery spherical side of the head and non-union results. He suggests instead that the arm be elevated forward at right angles to the trunk so that alignment is correct. For this purpose he uses a light cast with the forearm flexed close to the body and supported by a trusswork of plaster.

Vocational therapy Albee regards as valuable from several standpoints. Active motion is very potent in restoring function; it stimulates bone production and union and arouses in the patient a desire for accomplishment. R. V. FUNSTON.

**Corner, E. M.: Amputations: The Effect of War Knowledge on Teaching, Practice, and After-Care.** *Lancet*, 1921, cc, 114.

A study of the amputations performed during the war has shown that some stumps are more useful than others because they are more easily fitted with an artificial limb.

In the lower limb, amputation through the tarsal region has been abandoned because, when the front of the foot is sacrificed, the patient loses all spring. As the foot is largely a passive agent for transmitting pressure, it is more easily and satisfactorily replaced by the artificial limb. Amputation through the middle of the leg is preferable to the Syme amputation. Retention of the patella as in the Stokes-Gritti method is not necessary. The procedure of choice in amputation in the thigh requires a long anterior and a short posterior flap. At the hip joint amputation through the neck of the femur by means of an anterior racquet incision is preferred. It is of little use to amputate less than 3 in. above or below the level of the knee joint or less than 3 in. below the lesser trochanter.

All amputations of the forearm are done with equal anterior and posterior skin flaps and circular division of the muscles and bone. In the upper arm a circular incision is used, an internal incision being made over the vessels when close to or at the shoulder joint. A stump less than 3 in. below the elbow is useless.

The linear or guillotine amputation was found to have merit during the war. In subsequent opera-

tions the upper limb was often cinematized or re-amputation was done to adapt the stump for limb-fitting. Re-amputation has the advantage that all nerve ends and scar tissue are removed completely. The regeneration of nerve ends into still infected scar tissue may be responsible for the return of pain.

Light metal limbs have been found best in the early use of stumps of the thigh. It is well to encourage the patient to return to work and healthy surroundings as soon as possible. J. I. MITCHELL.

**Lenormant, C., and Lebrun, M.: Two Cases of Osteosynthesis for Fractures of the Elbow Complicated by Luxation** (Deux cas d'ostéosynthese pour fractures du coude compliquées de luxation). *Presse méd.*, Par., 1921, xxix, 41.

The first case reported was a fracture of the epitrochlea with luxation of the two bones of the forearm backward and outward and interposition of the detached fragment in the articular interline so that reduction of the fracture was impossible. It is usual in such cases to remove the misplaced fragment by arthrotomy, but in this instance it appeared more rational to replace the fragment in its correct position after reduction of the luxation and to fix it by means of a screw. The luxation recurred but was again reduced without incident and a perfect anatomical and functional result was obtained.

The second case was an oblique fracture of the base of the olecranon with forward luxation of the two bones of the forearm. The fracture was complicated, the point of the olecranon fragment having perforated the skin behind. This type of fracture and luxation is rather rare; a bloodless reduction is not satisfactory. The first two attempts to maintain the reduction of the luxation by osteosynthesis with Lambotte plates failed, and it was only in a third attempt by the use of a strong plate and wire that solid fixation was obtained. The result was perfect reduction of the luxation and consolidation of the fracture with preservation of about two-thirds of the flexion-extension movement. W. A. BRENNAN.

**Brooks, B.: Exarticulation of the Hip Joint, with Preliminary Ligation of the Common Iliac Artery.** *J. Am. M. Ass.*, 1921, lxxvi, 94.

Various methods for the control of bleeding during exarticulation of the hip have been devised. McBurney reported 3 successful cases of hip joint amputations in which the common iliac artery was temporarily compressed during the period of division and ligation of the vessels in the amputation wound. Halsted reports 30 cases in which the common iliac was permanently occluded without amputation of the extremity and states that uncomplicated permanent ligation of the common iliac artery is not apt to be followed by gangrene of the extremity. It would seem, therefore, that the common iliac artery might be permanently ligated preliminary to hip joint exarticulation without fear of gangrene in



the amputation flaps. The author reports a case in which this operative procedure was carried out.

The patient, a laborer aged 54, was admitted to the hospital June 1, 1920. The left thigh was tremendously swollen, the skin was shiny and tense, and on palpation a sensation of deep fluctuation was noted. The femur had been fractured February 14, 1920, and there had been no union of the bones. Very little tenderness and little pain was felt on movement of the extremity. A roentgenogram revealed extensive destruction of the middle third of the shaft of the femur. The patient's temperature was 101 and his pulse 120.

A diagnosis of osteomyelitis or neoplasm was made. An exploratory incision in the thigh was followed by uncontrollable hemorrhage. A tourniquet was applied and a mid-thigh amputation performed. During the operation the patient's pulse rose to 160 and his condition became alarmingly grave. It was clear that the amputation was made through tumor tissue. Microscopic examination of the tumor showed it to be a spindle-cell sarcoma.

The patient made a slow recovery from the operation. In order to save him from an ulcerating sarcoma of the thigh stump, an exarticulation of the hip joint was advised.

On July 2 an abdominal incision was made at the medial border of the left rectus at the level of the umbilicus. The left common iliac artery was easily exposed through a small incision in the posterior peritoneum and tied tightly with a double strand of braided silk. The ligature was placed halfway between the bifurcation of the aorta and the origin of the hypogastric artery. The abdomen was then closed.

The stump of the thigh having been flexed and abducted, the anterior and posterior flaps of the skin were cut. The femoral vein and artery were isolated, clamped, divided, and tied. The incision was carried through all the soft tissue down to the neck of the femur. The capsule of the hip joint was incised and the head of the femur exarticulated. In cutting through the soft parts bleeding from the sacral and the obturator arteries was noted. This bleeding occurred with considerable force and the blood was bright red. The streams did not pulsate. All of the soft tissues bled, but no more than half a dozen hæmostats were applied as all except the bleeding from the largest arteries quickly ceased.

The amputation wound was closed around a small cigarette drain at the lateral end of the incision.

The postoperative course was uneventful. The flaps healed by first intention and there was no discoloration of the skin.

In this case it was certain that the complete occlusion of the common iliac artery did not completely arrest the blood stream in the sacral and obturator arteries. From experimental work the author has been able to show that even a small blood stream to an extremity may be sufficient to preserve its complete vitality.

If preliminary ligation of the common iliac artery always resulted in the diminution of the blood stream, as in this instance, it might be possible to make amputations much more complete without serious operative risk.

Four months after the operation the patient weighed 25 lb. more than at the time of the fracture, and showed no evidence of recurrence of the neoplasm.

G. W. HOCHREIN.

**Walker, J. B.: Bone Grafting: A Study of a Series of Cases Operated Upon in U. S. Army Hospitals.** *Ann. Surg.*, 1921, lxxiii, 1.

Among 215,423 wounded in the A. E. F., there were about 25,000 fractures, and of these, 15,165 involved the long bones. Up to January, 1921, 906 cases of non-union (6 per cent) had been reported. Of these cases 611 were treated by bone grafting; 189 by means of Lane plates; 52 by suture with wire; and 54 by suture with kangaroo-tendon or chromic catgut.

Grafts were taken from the tibia in 338 cases. In 98 cases a sliding graft was employed. Pegs made from boiled beef bone were used in 25 cases, and pieces of rib in 31 cases.

Loss of substance between the separated ends of the fragments in cases in which it was reported averaged from 4 to 5 cm.

Fracture of the graft occurred in a considerable number of cases. The author calls attention to the necessity of immobilizing the limb firmly in a plaster of Paris cast for from eight to ten weeks. In addition, a supporting apparatus should be worn for several weeks longer, especially in cases of fracture of the lower extremity.

In 48 per cent of the rated cases the disability after treatment was 25 per cent or under; in 22 per cent, it was between 25 and 35 per cent; and in 8 per cent, it was over 51 per cent.

In order to obtain the best results in bone-grafting sufficient time must be allowed for the complete subsidence of the original infection before operation is attempted.

Autogenous grafts taken from the tibia proved to be the best material for bone grafting in fractures of the long bones.

G. W. HOCHREIN.

## ORTHOPEDICS IN GENERAL

**Lovett, R. W.: The Operative Treatment of Infantile Paralysis.** *Surg., Gynec., & Obst.*, 1921, xxxii, 20.

Lovett discusses briefly the indications for operative treatment in infantile paralysis and then describes in greater detail the operative procedures which may be applied to this condition. As the various cases differ so decidedly and each presents its own operative problem, he urges that before deciding upon his line of treatment the surgeon ask himself the following questions: What am I trying to do? Is it worth doing? Am I doing it?



The object to be obtained by operation is to help the patient who is able to walk, to walk more easily, and to help those who cannot walk, to walk. There are, therefore, two classes of operations: (1) those designed to relieve deformity, and (2) those designed to aid the muscles to act more advantageously.

For flexion contractures of the hip Lovett advocates Soutter's operation as most thorough and effective, while for paralytic dislocation of the hip in young children he recommends plication of the capsule rather than an arthrodesis. Flexion contractures of the knee he treats by applying a plaster cast to the knee, dividing the cast behind the joint, and inserting thin wedges of wood to straighten the knee. This procedure is simple and very effective.

Equinus deformity of the foot is easily relieved by tenotomy of the Achilles tendon but this should be done with caution. When the anterior muscles are badly paralyzed tenotomy may result in a flail ankle and therefore should be combined with tenodesis or the insertion of an artificial ligament. In cases of complete paralysis of the quadriceps a moderate amount of equinus is an aid as it assists in locking the knee in extension. The equinus deformity often yields to stretching by plaster.

After the deformities have been relieved by operation the patient may be taught to walk by the tripod method. While this method is not entirely satisfactory, it is a few degrees better than a wheel chair.

In considering the second class of operations, i.e., those performed to enable the patient to use the muscles to better advantage, the first step is to analyze the gait carefully in order to determine what muscle is responsible for the difficulty. If the difficulty is in the gluteus medius or maximus there is no satisfactory operative measure, but apparatus is of some help.

Below the knee, tendon transplantation, tenodesis, and astragalectomy are the most favorable operations. These procedures the author discusses at some length.

In the upper extremity the considerations are more complex. Two factors are necessary before any operation may be considered. These are: (1) flexion power in the hand and fingers, and (2) the ability to move the scapula on the thorax. At the shoulder the operation of choice is an arthrodesis. In the hand, tendon transplantation is often of value but each operation must be worked out on anatomical grounds.

B. H. MOORE.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Scalone, I.: The Operative Treatment of Pott's Disease** (*Processo per il trattamento operatorio del morbo di Pott*). *Chir. d. organi di movimento*, 1920, iv, 505.

The steps in the method employed by Scalone in the treatment of Pott's disease are as follows:

1. A median incision is made in the skin with its center at the kyphos or diseased focus as diagnosed from the seat of the vertebral pain or the radiological findings. It is then extended for the space of two or three spinous processes above and below this focus.

2. All the aponeurotic and muscular soft parts are dissected so as to lay bare the laminae throughout the whole length of the incision.

3. The periosteum is reflected down to the cortical layer of the bone.

4. Two small pieces of bone about  $2\frac{1}{2}$  cm. wide and sufficiently long to fix the portion of the vertebral column it is desired to immobilize are cut from the tibial diaphysis. These grafts include the periosteum and many reach to the medullary canal.

5. The two bone grafts are placed in two lateral grooves in such a way that their bleeding surfaces rest on the abraded surfaces of the vertebral laminae. They are not fixed by sutures.

6. The spinous processes are fractured close to the base in such a way that they reinforce the posterior median line of the vertebral column as in Hibb's operation.

7. The soft parts are sutured over the grafts, and the skin then sutured.

The advantages of this technique are:

1. The depth to which the grafts are inserted assures their taking and vitality inasmuch as they are surrounded by an extensive bleeding bone surface and tissues with good circulation.

2. The taking of the grafts is guaranteed also by the fact that they are little exposed to infection.

3. The technique is very simple as special instruments, such as Albee's saw, are not required.

4. Grafts of any size and shape can be placed in the two paramedian grooves without adapting them to the kyphos.

5. The duplication of the grafts prevents failure in case one of them becomes necrosed, and when both of them take, the vertebral column is strengthened more solidly.

6. Bilateral paramedian grafts are particularly adapted for cases with marked kyphos in which Albee's technique is difficult and there is danger of fracture of the graft.

7. The fracture and the thickening of the spinous processes along the median line as in Hibb's technique are added so that in the definite anatomical repair there is an extensive synostosis at the two sides of the vertebral column due to the two grafts and also a median synostosis along the line of the spinous processes.

W. A. BRENNAN.

**Sharpe, N.: Tumor of the Spinal Cord and Its Membranes.** *Med. Rec.*, 1921, xcix, 93.

Sharpe reports two cases illustrating how tumor of the spine may simulate organic disease, and the



amount of compression the cord can successfully withstand if it is applied gradually.

The first patient was a woman 28 years old. She had always been healthy but very nervous. In the summer of 1918, while nursing her mother and taking care of the rest of the family, she noticed transitory attacks of trembling and weakness of the left leg. A few months later this weakness appeared in the right leg. Subsequently spasticity of both legs developed.

When first seen by the author in June 1919, the patient showed a spastic paraparesis of the lower extremities, exaggerated reflexes, slight double ankle clonus, more marked in the left side, and a double Babinski. The upper abdominal reflexes were present and equal, but the lower right abdominal reflex was feeble and the left was absent. Tremor of the hands, intentional in type, and later nystagmoid twitchings in both eyes were noted. The optic discs were normal. There were no subjective or objective sensory disturbances and no pain at any time. A diagnosis of multiple sclerosis was made. Lumbar puncture a month later gave normal pressure findings, a normal clear fluid, and a negative Wassermann. The blood Wassermann was also negative.

The patient was lost sight of until January, 1920, at which time her condition had markedly changed. There was a complete spastic paralysis of both legs to the hips; motor power was entirely abolished except in two toes of the left foot. There was hyperæsthesia to all forms of sensation below the umbilicus. Touch sense was better maintained than pain and thermal sense. There was no tenderness over the spine and no disturbance of the sphincters. Lumbar puncture at this time showed few cells and a slight increase in globulin. A diagnosis of cord tumor near the tenth thoracic segment at the level of the seventh thoracic vertebra was made. The X-ray examination of the spine revealed nothing abnormal.

Laminectomy was done February 5, 1920, the laminae of the sixth, seventh, and eighth thoracic vertebrae being removed. A large extradural tumor the size of a hen's egg was found occupying the left portion of the spinal canal. Very marked erosions of the transverse arches and the laminae of the seventh and eighth vertebrae had occurred. The foramina of the seventh and eighth left posterior spinal roots were eroded and the roots flattened to ribbons. With the removal of the tumor normal pulsation returned in the portion of the cord compressed and the dura was not opened.

The patient made an uneventful recovery. Five months after the operation she walked normally with no trace of spasticity, was able to dance, did all her housework, and had resumed her normal life. The knee jerks were still plus and there was a double Babinski. Ten months after the operation the patient was well.

The tumor was reported by the pathologist to be an atypical spindle-cell sarcoma with many giant

cells and many unidentified crystals at the posterior pole where the capsule was missing.

The second patient was a male, 16 years of age. At the age of 12 he was struck by a street car, receiving general and severe bruises. He was not aware that his back was hurt. Three years later, in the fall of 1919, he had occasional shooting pains in the back and legs which were associated with slight tenderness of the back in the lower thoracic region. The pain in the back was increased by stooping. These transient pains continued until March 1, 1920, at which time complaint was made of a "pins and needles" sensation in the legs and weakness in both knees which occasionally caused the leg to give way. The condition was diagnosed as either polyneuritis or a beginning myelitis. The author saw the patient on March 23. At this time there was a flaccid paralysis of both legs to the groin, with marked wasting and atrophy of the muscles. Knee and ankle jerks were absent. Motor power was completely abolished except in the toes of the left foot. Tactile sense was preserved, but there was hyperæsthesia to pain and temperature in both legs. Sphincter disturbance was present but not marked. Tenderness to pressure was found over the spine from the eleventh thoracic to the second lumbar vertebra. The X-rays revealed nothing abnormal in the spine.

An exploratory laminectomy was performed March 29, 1920. When the laminae of the twelfth dorsal and first lumbar vertebrae were removed a bulging dark red mass was revealed which entirely filled the spinal canal. Removal of one spinous process and the laminae above disclosed a normal pulsating dura. Removal of the laminae below exposed a bluish congested dura without pulsation. The large part of the dark red mass was removed by blunt dissection. It came away in friable, laminated sections and consisted apparently of organizing blood clot. Beneath the dark red mass was a band of dense yellowish fibrous tissue 1 in. wide which encircled the dura and closely adhered to it. This was divided and dissected from the dura with great difficulty. With division of the constricting band normal pulsation appeared in the dural sac below the lesion. The dura was not opened and the wound was closed with one drain down to the tumor site.

A profuse, grumous bloody discharge occurred for two days after the operation. A low-grade suppuration followed but speedily cleared up under treatment with Dakin's solution. The pain in the back disappeared with the operation. Three months later the patient was able to walk up and down stairs and across a room unaided. The muscles had rounded out and the left leg was almost normal in size and strength. The right leg was still weak but improving. He was still improving steadily when seen eight months after the operation.

Pathologic examination showed the tumor to be an endothelial angioma springing from the connective tissue. Doubt was expressed as to its malignancy.

MARGARET I. MALONEY.



## MISCELLANEOUS

## CLINICAL ENTITIES — GENERAL PHYSIOLOGICAL CONDITIONS

**Parker, H. L.: Juvenile Tabes; A Review of the Literature and a Summary of Seven Cases.**  
*Arch. Neurol. & Psychiat.*, 1921, v, 121.

A clinical picture resembling that of tabes dorsalis seen in adults was noted in a certain number of children with syphilitic parentage and positive findings of syphilis examined at the Mayo Clinic. This suggested a review of the literature of the past twenty years for reports and discussions of similar cases.

A great number of articles have been written on juvenile tabes and the authors agree on many points, such as the symptoms and physical signs. Remak, in 1885, described the first case of the disease. Later many other cases were recorded in series by Hirtz and Lemaire, Cantonnet, Lasarew, and Marburg. There no longer remained any doubt as to the existence of such a disease; moreover, points were established which distinguished it from the adult type.

Juvenile tabes is more rare than juvenile paresis; there are about 10 cases of the latter to 1 of the former in any group of juvenile neurosyphilitics. Juvenile tabes dorsalis due to inherited syphilis is much more common than that due to acquired syphilis. In all cases a close study of the sera of the patient and his immediate relatives is essential as more stress is to be laid on the presence of syphilis than on any other one physical sign, such as ataxia.

Tabes dorsalis has no special sex difference except that it is more common in the male adult. The average age at which the diagnosis is clear is 14 years. The history of many cases in the literature supports the assumption that the infection is acquired early; there are instances of infection at 5 years of age and even earlier. A remarkable feature of the disease is the frequency with which the parents of the child are found to have tabes dorsalis or paresis. This introduces the question as to the specificity of spirochætes in the production of a certain type of neurosyphilis; a family predisposition to syphilitic disease of the nervous system is also suggested.

The course of the disease is protracted. Patients who have been followed for as long as ten years have shown little change provided they have kept the clinical picture of tabes dorsalis. Frequently paresis develops and when this change is instituted the degenerative course is rapid.

Authors are in general agreement on the fact that, while any symptoms found in the adult type of the disease may be present in the juvenile type, there is a difference in the frequency of the symptoms and signs and in the order of their occurrence. Incontinence of urine and bed wetting were considered the earliest and most frequent symptoms, but next in importance are optic atrophy and blindness. Optic atrophy is more common in young persons

than adults. Lightning pains are common and are observed as often in young persons as adults, but are not so frequent as optic atrophy and blindness.

Sensory changes were present in many of the cases recorded, but there was some difference of opinion as to their frequency and severity. Ataxia was very infrequent. Two-thirds of adults with tabes have ataxia, while only one-third of young persons with tabes are so affected. Gastric crises were present in about 19 per cent of the cases recorded and Romberg's sign was seen in about 75 per cent. Patellar reflexes were absent in about 80 per cent; in the juvenile type of the disease this is as common a sign as in the adult type. Nonne recorded a case of juvenile tabes with Charcot joint.

Most of the literature reviewed was written before syphilis was established as the direct cause of tabes dorsalis and when in the diagnosis more stress was laid on the presence or absence of certain physical signs. Since the most prominent sign of locomotor ataxia is the ataxia, this was taken as a criterion of the presence or absence of the disease. Many cases were rejected because ataxia was not present and more were included in the series as cases of tabes dorsalis only because they were ataxic. At present a positive history of syphilis and a positive Wassermann test of the blood and spinal fluid are relied on.

Seven cases were selected from the records of the Mayo Clinic as cases of juvenile tabes dorsalis. These were studied from the point of view of the symptoms, the course of the disease, and the physical signs, and were compared with the cases recorded in the past. Westphal's sign was present in all 7 cases, while in 6 some degree of diminution of sensibility was found, in 4 the pupils were immobile, and in 3 Argyll Robertson pupils were noted. In 3 cases there was optic atrophy and in 3 there were lightning pains. In 3 cases there was incoördination, and in 3, evidence of congenital syphilis or syphilis outside the nervous system. In 3 there was hypotonia, and in 2, incontinence of urine. In only 1 was ataxia present. The serum Wassermann was triple positive in all but 1 case and in that case the spinal fluid test was positive. In 6 cases a spinal fluid examination was made; in 3 the Wassermann test was negative, but in 1 of these the cell count was 36. A Lange test, performed on only 1 patient, had a "syphilitic" curve. Points worthy of note are the frequency of pupillary and sensory changes, optic atrophy, crises, lightning pains, and incoördination. Three of the spinal fluids were negative to the Wassermann test in spite of a positive blood serum. Hypotonia was present in 3 cases and 1 patient was able to adopt the most grotesque and extraordinary postures. Four patients had large irregular pupils with no reaction to light or accommodation. This is in contrast to the more usual myosis and Argyll



Robertson pupils of adults. The findings in the 7 cases differ little from those reported previously except that incontinence of urine was not present so frequently. The meagre physical signs, the long insidious course of the condition, and the rarity of ataxia in these 7 patients agree well with what has been observed before.

**Crile, G. W.: The Mechanism of Shock and Exhaustion.** *J. Am. M. Ass.*, 1921, lxxvi, 149.

A man in acute shock or exhaustion is able to see danger, but lacks the normal muscular power to escape it; his temperature may be subnormal, and he lacks the normal power to create heat; he understands what is said to him, but lacks the normal power of response. In other words, he is unable to transform potential into kinetic energy in the form of heat, motion, and mental action, despite the fact that his vital organs are anatomically intact. His mental power fades to unconsciousness; his ability to create body heat is diminished until he approaches the state of the cold-blooded animal; the weakness of the voluntary muscles finally approaches that of sleep or anaesthesia; the blood pressure falls to zero; most of the organs and tissues of the body lose their function.

The tissues and organs whose failure of function may cause acute exhaustion are the respiratory system, the circulatory system, the blood, the muscles, the suprarenals, the liver, and the brain.

Park first suggested, and Bissell demonstrated, the presence of fat embolism in the lungs of patients who were diagnosed as being in surgical shock. Porter later concluded that shock was due mainly to diffuse fatty embolism of the lungs.

In cases of abdominal penetration there is little shock if there is no perforation of the hollow viscera and no hæmorrhage, but if there is either perforation or hæmorrhage, or both, shock results.

Exhaustion due to running, fever, trauma, anaesthesia, excision of the liver, excision of the suprarenals, hæmorrhage, emotion, or insomnia is not in any way related to the lungs. If there is a coexistent defect in the pulmonary function, however, exhaustion is produced more readily by trauma, emotion, fever, exertion, hæmorrhage, etc. The author therefore concludes that the primary cause of exhaustion may be found in the pulmonary system, but that this is not often the case.

Crile likewise believes that in the absence of primary disease causing changes in the blood and in the absence of hæmorrhage, changes in the blood or in the blood pressure are a secondary rather than a primary cause of exhaustion.

If the voluntary muscular system were exhausted primarily in shock, there would be prostration, low temperature, a lowered blood pressure but not the extremely low blood pressure often seen in shock, no sweating, and no loss of consciousness. Therefore it is apparent that primary exhaustion of the voluntary muscles could not be an adequate cause for all the symptoms of exhaustion.

Experimentally the suprarenals have been found to be factors in the primary cycle of exhaustion although their rôle has not been accurately defined.

Is the primary cause of exhaustion to be found in the liver? That the liver is necessary to the functional activity of the brain is proved by the following facts:

1. After excision of the liver, the power of the brain to drive the organism, to transform potential energy into kinetic energy, such as heat or muscular or mental action, is rapidly diminished and completely lost at the time of inevitable death, usually within a few hours.

2. The brain cells show changes in their cytologic structure which are progressive from the moment the liver is excised.

3. After excision of the liver the temperature of the brain falls progressively until death.

4. In every type of exhaustion from whatever cause the cells of the liver invariably show cytologic changes, such as diminished power of differential staining, oedema, and eccentric position of the nucleus.

5. Granting adequate circulation and respiration in a decapitated animal, the excision of the liver causes death earlier than decapitation or suprarenalectomy.

The integrity of the liver is essential to the work of the brain and to the elimination of the acid by-products of metabolism by the kidneys and the lungs.

In the author's studies of electrical conductivity he found that in exhaustion from any cause the effects upon the liver and the brain were exactly opposite, that is, in extreme exhaustion the conductivity of the brain was decreased and the conductivity of the liver was increased.

With reference to the part played by the brain in the production of exhaustion the question comes up as to whether the brain is capable of exhausting itself primarily by its own excessive work or is exhausted only secondarily.

The work of the brain is greater in proportion to the weight of its tissue than the work of any other organ of the body. The brain is the master tissue of the body. Therefore, when we speak of exhaustion as applied to a human being we mean exhaustion of the brain.

M. I. MALONEY.

**Rosenheck, C.: Backache Due to Neurological Conditions.** *N. York M. J.*, 1921, cxiii, 138.

Backache as a distinct neurological manifestation holds a secondary place in neurological affections. On account of the anatomical proximity of the back muscles to the spinal cord the natural presumption is that this symptom would at once obtrude itself in the clinical picture as a major symptom.

The etiological factors involved in the causation of backaches in neurological affections is to be looked for in those morbid processes which at once affect the integrity of the dural covering and the dorsal roots. Degenerative diseases of the spinal



cord may cause backache, but the pain in these affections is insignificant and must be explained more on the ground of interference with the motor activities. Traumatic neuroses and neurasthenia are particularly prolific in producing painful and persistent backache. Quite recently the appellation "traumasthenia" has crept into the literature and the author believes this aptly describes the condition of traumatic neurosis.

The pathologic processes which cause back pain obviously vary and are determined by the underlying conditions. Broadly speaking, these are hæmorrhage, inflammatory affections, and new growths.

The neurological conditions which produce backache as a symptom are acute and subacute inflammatory diseases, hæmorrhage, new growths, degenerative diseases, and the neuroses.

In epidemic cerebrospinal meningitis the backache very often ushers in the disease. The pain is diffuse, embracing the muscles in proximity to the entire vertebral column.

In acute myelitis of the cord, pain in the back is a prominent complaint. It comes on early in the disease, but does not persist; with the appearance of the paralytic phenomena it usually subsides. The localization of the pain depends on the anatomical situation of the infectious process.

In Landry's paralysis backache is apparently not a constant symptom.

In the severe types of acute poliomyelitis with dural involvement backache is very severe and persistent and assumes the characteristics of the pain in cerebrospinal meningitis. It may be coincident with the onset of the infection or precede it by a number of days. The spinal muscles are held rigidly as all movement, either volitional or induced, intensifies the distress. The pains persist throughout the acute phase of the disease and subside with the onset of the paralytic phenomena.

In herpes zoster severe and persistent pains in the back often herald the advent of the condition. The pain is sharply localized and in approximate relation to the involved posterior root and its ganglion. It is described as gnawing and burning in character. With the appearance of the herpetic vesicles, the pains assume a radiating character and are definitely marked by the anatomical distribution of the intercostal nerves.

Hæmorrhage affecting the spinal meninges (hæmatorrhachis) is associated with backache of the most violent kind. The extravasation of blood may occur either in the epidural or subdural space. Almost as soon as the bleeding begins the irritative phenomena assert themselves. There is excruciating pain sharply localized and in approximate relation to the site of the hæmorrhage. As the blood gravitates into the dural sac the pains travel downward and eventually involve all of the spine below the point of bleeding. The back muscles become very rigid and pressure or movement greatly increases the distress.

Hæmorrhage into the cord substance (hæmatomyelia), if extensive, may produce backache as the result of lateral distention of the cord with consequent pressure on the dural covering and the posterior roots. The pain is of sudden onset, becomes sharply localized, and is in approximate relation to the site of the hæmorrhage.

Hyperæmia of the cord as a cause of backache was a common diagnosis and in great favor with the clinicians of the past. In the light of modern pathology the diagnosis of hyperæmia of the cord belongs more to the realm of fancy than to fact. As a cause of backache, therefore, it may be left out of consideration.

Déjerine has described a syndrome in intermittent claudication characterized by severe lumbosacral pain with transient sensory and motor disturbances affecting the lower extremities. The author was able to confirm Déjerine's observations in one of his own cases in which there was marked evidence of arteriosclerosis.

The rare possibility of enlargement of the spinal veins in relation to unexplained backache is to be borne in mind. These vascular abnormalities give the clinical picture of new growths of the cord with all their attendant pressure effects. The character of the back pains, therefore, is to be interpreted from this viewpoint and merits no special description.

In a considerable number of tumors of the cord, particularly those of the extradural or intradural type, backache may be an early complaint. The character of the pains may be described as boring, burning, or a vague sense of pressure. Their localization depends on the site of the tumor mass. In the intramedullary type of tumor back pains are seldom present.

Syphilitic affections of the cord and meninges readily assume the characteristics of tumors with pressure effects. Thus the localized or diffuse types of meningomyelitis may be ushered in by severe back pains. Such pains come on insidiously and may involve the entire musculature of the back. At times they are distinctly localized and then again may shift about and eventually become diffuse. The distress is increased by pressure on, or movement of, the spine. Rigidity of the muscles is not uncommon, and in some cases is very marked.

Pain in the cervical region is a very early symptom in pachymeningitis cervicalis hypertrophica. It is sharply localized and characterized by its severity and persistence. It may be described as boring or pressing. Two patients under the author's care described the pain as a combination of pressure and paræsthesia. The muscles in the cervical area may be rigid and sensitive to pressure. The localization of the pain lasts for a variable period and is followed by the usual radiation indicating involvement of the posterior roots.

Tabes dorsalis may begin with a persistent pain in the back but this is not permanent or characteristic.



Paralysis agitans, combined sclerosis, multiple sclerosis, and the various types of secondary tract degenerations may be associated with pain in the back at some time during their onset or course of development.

In traumasthenia and neurasthenia backache is the chief symptom. In traumasthenia the backache follows soon after the primary effect of the injury has passed away. The pain may be diffuse or localized to the lower lumbar area. The distress is constant and increased by physical effort. It is described as a sense of weight and pressure, and there are areas of extreme tenderness to pressure. Rest has little, if any, influence in alleviating the pain. It may also assume a lancinating character and become associated with moderate paræsthesia.

The chief characteristics of the backache of neurasthenia are the persistent and diffuse character of the pain, early fatigue of the back muscles after physical or mental effort, marked points of tenderness over muscle segments, and evident emotional instability.

When a patient complains solely of back pain the most thorough inquiry and examination should be made in order to discover its cause. The practitioner must always bear in mind the fact that backache is only a symptom of an underlying disorder which painstaking examination will reveal.

The treatment of backache in neurological diseases is obviously the treatment of the underlying condition causing the disturbance. M. I. MALONEY.

**Stokes, J. H.:** Erythema Nodosum and Tuberculosis; Report of a Case Terminating in Tuberculous Meningitis, with Necropsy. *Arch. Dermat. & Syph.*, 1921, iii, 29.

In a number of instances patients have developed tuberculous meningitis shortly after attacks of erythema nodosum. The sequence would imply that the infection is blood-borne, but most attempts to demonstrate the bacilli in the blood or the nodose lesions have been unsuccessful.

The author reports a case as further evidence that erythema nodosum may be of tuberculous etiology. A girl 19 years of age had had an eruption over the shins and knees associated with severe rheumatism for a period of one week. An older sister had recently died of tuberculosis. When the patient was examined her temperature was 100. The physical and X-ray examinations of the chest were negative, the urine was normal, and the spinal fluid Wassermann negative. There were no palpable glands.

The patient improved under treatment with salicylates and rest in bed. Twenty-nine days after the first appearance of the erythema nodosum she developed a stiff neck and in rapid succession the symptoms of a tuberculous meningitis. The spinal fluid showed a negative Wassermann reaction, a positive Nonne reaction, 42 lymphocytes, and tubercle bacilli. Necropsy disclosed extensive and recent miliary tuberculosis. The oldest lesions had been present approximately three or four weeks.

Histopathologic examination of a bluish patch over one of the tibiae showed nothing to suggest the histologic picture of a tuberculous process and no tubercle bacilli were found.

In discussing this case Stokes emphasizes the absence of any clinical evidence of tuberculosis at the time of the first examination, the correspondence of the onset of erythema nodosum with the time of generalization of the tuberculous infection, and the absence of septic foci responsible for erythema nodosum of the streptococcal or Rosenow type.

A. J. SCHOLL, JR.

**Zeisler, E. P.:** Tuberculosis of the Lip. *Arch. Dermat. & Syph.*, 1921, iii, 14.

Tuberculosis of the buccal cavity occurs in forms almost as diverse as that of the integument. The subject is given scant consideration in textbooks on dermatology. That such cases are rare is difficult to explain in view of the frequency with which tubercle bacilli in the sputum come in contact with the lips.

The case reported represents an unusual instance of solid tuberculoma of the lower lip with ulcerations of the buccal mucosa, associated with a chronic pulmonary tuberculosis of the fibrous type. The diagnosis was verified by the finding of tubercle bacilli and the characteristic histology. It was necessary to differentiate chancre and epitheliomatous ulceration. W. H. NADLER.

**Theilhaber, A.:** The Occurrence and Prevention of Recurrence after the Removal of a Carcinoma (Die Entstehung und Verhuetung der Rezidive nach Beseitigung der Carcinome). *Strahlentherapie*, 1920, xi, 208.

In the fight against cancer recurrence the author places the greatest importance on our knowledge of the causes of cancer, especially predisposition to cancer and the natural immunizing forces of the organism against it. These facts Theilhaber discusses in detail but he cannot expect that some of his entirely original theories will go unchallenged.

Cancer predisposition is partly familial. It bears an inverse relation to the abundance of blood vessels in the uterus (obliteration of the vessels in the climacterium). For this reason scars and organs which are chronically inflamed are predisposed to the development of cancer. Moreover, the character of the connective tissue plays such an important rôle that the danger of cancer increases as the number of cells in the connective tissue decreases. Round cells and connective-tissue cells form the defense of the connective tissue against the advance of epithelial growth. Therefore at the borders of an epithelial invasion and connective tissue round cells are always heaped up and the wall of round cells is observed also during the retrogression of the cancer, i.e., after radiation.

The author believes that in every carcinoma there is continued destruction of the epithelial cells by the round cells and connective tissue growth so that



eventually spontaneous cure may occur. This spontaneous absorption of the carcinoma is observed more often in gland metastases than in the primary tumor as the glands are able to mobilize larger numbers of leucocytes whereas the primary tumor is situated in a region more predisposed to cancer. The almost complete immunity of youth to cancer is attributed in great part to the greater abundance of cells in young connective tissue.

A further cause predisposing to cancer the author sees in the increasing atrophy of age and the associated decrease in the function of the blood-forming organs (spleen and bone marrow). He even attributes a cancer-destroying function to the spleen, basing his contention in part upon the fact that the spleen is rarely involved by malignant new-growths or their metastases. On the other hand, there must be some relationship between cancer and goiter as in goitrous regions the predisposition to carcinoma seems greater. Furthermore Theilhaber has been able to prove experimentally that good function of the uterus stimulates the formation of round cells and therefore in a certain sense has a cancer-destroying action whereas atrophy of the uterus increases the disposition to cancer.

The author believes the generative glands (ovary and testicle) have characteristics favoring cancer. Their action is expressed in part in an increase in the aggressiveness of the epithelial cells and in part in a decrease in leucocytosis. This increase in the aggressiveness of the epithelial cells may be brought about also by trauma. Spontaneous healing of carcinomata developing after febrile disease is attributed to hyperfunction of the blood-forming organs. Local acute inflammation and general inflammation increase the resistance of the organism to cancer. Cancer due to the effect of the X-rays is analogous to an experimentally induced cancer and demonstrates that by extensive injury of the resisting forces of the organism, especially of the round cells and their sites of origin, a cancer may be produced. It proves further that marked insufficiency of the protective power of the organism to epithelial growth is an important factor in the development of carcinoma.

While, in general, thorough destruction of all cancer tissue is the best means of preventing recurrence, the author lays special emphasis upon the fact that the protective forces of the body should be spared and strengthened in order to decrease the predisposition to cancer in the hope that thereby any remaining cancer nests may be healed spontaneously. On the basis of this theory Theilhaber discards the Wertheim operation for cancer of the uterus, and in cancer of the breast removes only the breast and does not clean out the axilla if no palpable glands are present. He attaches special importance to the after-treatment given to augment the normal protective forces against carcinoma. Diathermy takes first place. Its action causes not only a hyperæmia but an acute inflammation with an increase in the number of leucocytes. In the majority of cases the

author believes he has been able to effect considerable amelioration of pain and in one group there was also a transient decrease in the size of the tumor.

To increase the inflammatory reaction of diathermy Theilhaber has constructed special electrodes and from their use he expects to obtain further retrogression of the tumors.

The general predisposition to cancer is lowered by diathermy also through the formation of anti-epithelial bodies (alexines). At times after diathermic treatment a considerable increase in the number of leucocytes in the blood may be noted. Intensive X-ray treatment of carcinomata for the prevention of recurrences is discarded because, on the one hand, the alexines in the round cells, connective-tissue cells, and tissue fluids are destroyed and the blood-forming organs are damaged, while on the other hand there is the danger of X-ray cancer.

Theilhaber prefers raying with moderate roentgen doses with simultaneous diathermy and injections of the organic extracts believed to have a cancer-destroying action. For this purpose an extract of foetal spleen should be especially valuable. In addition to these measures to obtain active immunization, the withdrawal by venesection of from 1,000 to 1,200 c.cm. of blood is recommended. Moreover, as the gonads stimulate the growth of epithelium their removal is advised to prevent recurrence. Following the removal of a mammary carcinoma the author invariably rays the ovaries to produce sterilization when the patient has not reached the menopause. He strongly considers also X-ray castration of the male to prevent recurrences. Other factors increasing the natural resistance are artificial heliotherapy, high altitude, sea air, and abstinence from alcohol and from a diet rich in meat. HARMS (Z).

#### SERA, VACCINES, AND FERMENTS

Schuster, D.: *The Results in Cases of Surgical Tuberculosis Treated According to the Methods of Deyke-Much and Friedmann* (Ergebnisse der nach Deyke-Much und Friedmann behandelten Fälle von chirurgischer Tuberkulose). *Mcd. Klin.*, 1920, xvi, 1287.

Thirty children were treated according to the method of Deyke-Much. The M-Tb-R was used principally and the treatment was begun on the fourth day after the diagnostic intracutaneous injection was made to determine the initial dose. On the occurrence of a reaction at the site of injection and disturbance of the general condition the treatment was terminated. Two series of treatments were given; in addition, the usual surgical and conservative methods were employed.

Two years after the end of treatment 22 patients were re-examined and a questionnaire was answered by 5. In only 3 cases (1 gland case and 2 bone cases) could a favorable influence be attributed to the treatment. In 7 cases there was transitory improvement and in 13 cases no effect at all. Therefore this



method is of no decided influence on the course of the condition; its value is slight. Comparison with the old tuberculin treatment showed that both methods are of about equal value.

Twelve children were treated by Friedmann's method. In 2 cases a cure was obtained which must be attributed to the Friedmann method. One, a severe case of tuberculosis of the elbow, healed in six months, and 1 case, a case of tuberculosis of the epididymis, healed in eight weeks but in the latter the pulmonary tuberculosis was aggravated. In another case, tuberculosis of the elbow was benefited but the patient died of pulmonary tuberculosis eighteen months later. In 7 cases no improvement at all was noted. In 1 case the disease became decidedly worse and caused death shortly thereafter. In the twelfth case there was rapid aggravation of the pulmonary process; whether the injection was the cause of this or not must remain unsettled. On the basis of these cases, therefore, conclusive evaluation of the Friedmann serum is not possible.

SIMON (Z).

**Petersen, W. F.: The Non-Specific Reaction.**  
*J. Am. M. Ass.*, 1921, lxxvi, 312.

Petersen speaks of a method of therapy developed in the course of the last six years which is interesting not primarily because of the clinical results achieved, but because it promises to exert a far-reaching influence on medical theory concerning the factors which are active in recovery from disease. He discusses briefly two common misapprehensions with regard to non-specific therapy: (1) that it represents a new and heretofore unknown and unused method of treatment; and (2) that, immunologically illogical, it is purely empirical in character.

As a matter of fact this form of therapy, by whatever name it is called, formed in all probability the basis of the very earliest and most primitive methods of practice in history. In one form or another—the cautory counter-irritation or the fontanel—it held sway for long periods of time, and under a variety of more modern terms it has been met again and again in recent practice. The reaction of inflammation is found fundamentally similar, whatever the cause of the injury, whether it is bacterial, toxic, chemical, or traumatic. The fundamental alterations are always alike. Dealing with the effort of the organism to dilute the noxious agent, to neutralize it, to remove it by extracellular or intracellular digestion, and, failing that, to wall it off, to put it outside the current of organ activity, Petersen states that if this process is to be altered therapeutically there are two methods by which it may be done. The one deals solely with the cause of the inflammatory reaction—if it is a bacterium, a bactericidal substance must be produced; if a toxin, an antitoxin is necessary; if a chemical, it must be neutralized. As the causes of inflammation and tissue injury are unlimited, the applicability of special agents is unlimited. The other method consists of an endeavor to alter the

reaction of the body, that is, to alter the inflammatory reaction—accelerating or retarding it as may be desired—rather than an attempt to alter the agent which has caused the injury.

Apart from the active phase of increased resistance which brings into play definitely dynamic but previously latent powers, there is a second method of defense which finds its expression in an increased tolerance to intoxication. This condition is closely associated with the state noted after anaphylactic shock—anti-anaphylaxis or desensitization. Starkenstein carried out a series of experiments in which he determined that after non-specific injections of various kinds—milk and proteoses as well as calcium chloride, cinchophen (atophan), etc.—the organism became more resistant to a variety of poisons such as strychnine, phenol, and protein split-products.

Clinically and experimentally the non-specific reaction is a diphasic reaction. The first phase (negative) is associated clinically with an intensification of the disease manifestations, while the second phase (positive) is associated with clinical improvement, reconstruction, general euphoria. It seems probable from clinical observation that the second or positive phase is in a measure a function of the negative phase in that within certain limits the greater the irritation the greater the tendency to complete restitution to the normal when the balance once swings in that direction. It is equally apparent that in dealing with such a reaction at times decided harm instead of good may be done.

Non-specific therapy is a new method of therapy insofar as it represents the clear-cut recognition of the fact that certain clinical results heretofore obtained in a variety of ways and with a number of different substances are in reality due to a similar biological alteration on the part of the organism. Some of the results previously accepted on the basis of specificity are now known to have been due to this non-specific effect. In differentiating between the specific and the non-specific phases of resistance and in developing them in an unbiased manner very definite therapeutic advances seemed possible, but it is certain that non-specific therapy is still to some extent in an experimental stage and the ultimate range of its usefulness is as yet undetermined.

G. E. BEILBY.

**Miller, J. L.: Foreign Protein Therapy in the Acute Infections.** *J. Am. M. Ass.*, 1921, lxxvi, 308.

During the last six years a very extensive literature on foreign protein therapy has developed. Previous to this time, however, there were a few references, either clinical or experimental, to the curative or protective action of non-specific vaccines.

The real stimulus to the investigation was the report of Ichikawa and Kraus and Mazza that a certain percentage of typhoids terminated by crisis following the intravenous injection of colon bacillus



vaccine. It was soon demonstrated that the same results could be obtained with non-bacterial proteins such as normal sera, proteoses, sodium nucleinate, milk, and the colloidal metals. With the exception of milk, all of these agents were given intravenously.

Following the administration of any one of these substances a febrile reaction occurred which was thought to be essential if beneficial results were to follow. As a rule this rise in temperature was preceded by a well-marked chill. When the dosage was excessive, nausea and vomiting sometimes occurred.

Following the injection and preceding the rigor there was usually a leucopenia followed by a polymorphonuclear leucocytosis which reached its maximum in from two to twelve hours after the chill. The leucocytosis varied in degree, but not infrequently reached 40,000. Apparently, however, there was no special relationship between the degree of the leucocytosis and the beneficial results following the treatment.

Foreign protein therapy was used in practically all of the infections with reported beneficial results in some cases. The various forms of arthritis and typhoid fever received the most attention. Other conditions regarding which less extensive reports are available are gonorrhoeal complications, pneumonia, certain dermatological diseases, iritis, trachoma, diphtheria, anthrax, acute sepsis, tuberculosis, and syphilis. However, many of the reports are so fragmentary and the investigations were so lacking in controls that it is impossible to draw conclusions. In other tests the results were at least suggestive, while in still others the curative value of the method seemed to be definitely established.

This form of therapy was used by a number of investigators in the treatment of typhus fever. Tagle reported 59 cases with 3 deaths, while the mortality of the 15 controls was 40 per cent. Reports from other sources indicate that this method of treatment lowered the mortality in typhus fever. The treatment of sepsis by means of foreign protein has been reported from various sources. Kraus and Wilmette each reported short series of cases of puerperal sepsis. Both of them were very enthusiastic, stating that the majority of cases terminated by crisis after a few injections. Kinsella showed that in septic endocarditis the blood became sterile for twenty-four hours after the febrile reaction, but that at the end of that time the micro-organisms reappeared. The author tried this method in several cases of septic endocarditis but without beneficial effect, either permanent or temporary.

Experience has shown that when the dosage is carefully determined, i. e., just a sufficient amount to excite a chill, foreign protein therapy is practically free from danger. At Cook County Hospital, Chicago, at least 2,000 intravenous injections of typhoid vaccine have been given in the treatment of various acute infections without serious consequences. The only untoward results observed were the development of delirium tremens in con-

firmed alcoholics. The treatment was not administered to enfeebled patients, however, or to those with disturbed heart action. Whether there is advantage in the use of a larger dose of protein than that necessary to excite a chill has not been determined. The use of such large doses would probably increase the danger attendant on the treatment.

The permanent value of this method is still to be determined. As the immediate disappearance of all evidence of infection in a certain rather small percentage of cases following protein therapy was established, this should serve as a stimulus to future well-controlled investigation.

G. E. BEILBY.

**Durand: Protein Therapy in Infectious Diseases**  
(La proteinoterapia nelle malattie infettive). *Riforma med.*, 1921, xxxvii, 2.

From the data obtained in clinical cases which he reports the author comes to the conclusion that hypodermic injections of protein substances (milk) modify the quality and quantity of the normal elements of the blood. Within the first twelve hours as a rule there is a decrease in the number of red cells and an increase in the number of white cells, especially of neutrophile polymorphonuclears. Subsequently there is a tendency to return to the normal, but the white corpuscles still remain increased. The complement-fixation power of the blood reaches its highest value in the period of numerical reduction of the leucocytes (phagolysis).

The injection of protein substances excites the generic defensive power of the organism and is able to bring to the circulation a greater quantity of the specific antibodies of an infection still present and to cause the reappearance of those of a disease which has subsided. The author has noted also that the injection of proteins always causes albuminuria, but this generally disappears in about three days.

W. A. BRENNAN.

**Cowie, D. M.: Non-Specific Protein Therapy in Arthritis.** *J. Am. M. Ass.*, 1921, lxxvi, 310.

Cowie states that it cannot be questioned that very remarkable beneficial effects have followed the intravenous injection of foreign protein in arthritis. There is seldom a case of acute arthritis or peri-arthritis which does not respond to a certain degree. This improvement, however, is of only a few hours' duration. Taking cases at random, a large percentage will be found in which no permanent beneficial effect can be obtained by this method of treatment. Permanent beneficial effects are not to be expected in cases of peri-arthritis of a less chronic nature unless care has been taken to rid the body of all foci of infection which can possibly be found. Accordingly, therapeutic intravenous injections of foreign protein should follow failure to secure successful results by the removal of such foci of infection or should be used in conjunction with an attempt to remove the focus.

Decided relief from pain will often follow protein therapy even though the focus of infection is not



removed, and in some cases, in addition to improvement in the joint condition, the focus itself becomes quiescent.

As far as is known, foreign protein acts by combating infection. If the large majority of joint diseases are due to infection and only comparatively few to metabolic disturbances, then foreign protein therapy is not contra-indicated in any form of this large group, provided no other forbidding features, such as serious heart disease, are present.

Experience has taught that the best results are obtained in acute or subacute processes which have not progressed beyond the first year, particularly when they have not gone on to marked structural change of the articular or peri-articular tissue. Next to these are the cases which have progressed longer and show structural change, but in which definite ankylosis and its results have not developed. Cowie believes that the work which has been done warrants the statement that acute and subacute arthritis and peri-arthritis are the forms which respond most promptly and surely to this method.

It has been shown that no negative phase, so far as the antibody content of the blood is concerned, follows the injection of foreign protein. For this reason daily injections seem justifiable. On the other hand, if the severity of the reaction and the patient's condition are taken into consideration, it is good practice to allow a day to intervene between the injections. If any benefit is to be secured by this method of treatment, from 1 to 10 injections are sufficient. No anaphylactic shock phenomena accompany the injections, even though a second course of treatment may be given after several months. Sterile albumose solutions, horse serum, and bacterial proteins bring about similar results. The severity of the reaction is in a measure proportional to the size of the dose. Uncompensated cardiac lesions, acute endocarditis, or pericarditis are considered to be contra-indications. The manner in which the foreign protein acts has not been determined, and only a certain percentage of the cases of any form of joint infection are benefited. Therefore a given case should be approached with definite conservatism.

G. E. BEILBY.

**Culver, H.:** Intravenous Protein Injections in Urology and Dermatology. *J. Am. M. Ass.*, 1921, lxxvi, 311.

Since 1913, when Bruck and Sommer used intravenous injections of killed gonococci in the treatment of complications of gonorrhoea, a considerable number of articles have been written on the subject. Bruck and Sommer used special care in securing highly polyvalent gonococcal vaccines and in so doing believed they were able to influence all such infections specifically. This theory and method of treatment, while not generally adopted, had many adherents for three years.

Toward the end of that period the non-specific factors in the treatment of infections were being recognized. Muller and Weiss by the intragluteal

injection of milk secured results in gonorrhoeal complications which compared favorably with those of Bruck and Sommer, and Miller and Lusk obtained encouraging results in gonorrhoeal arthritis by the use of intravenous typhoid vaccine. While 4 cases of acute gonorrhoeal arthritis in their series received less benefit from this treatment than acute cases of other origin, they nevertheless showed slow improvement. One case of subacute gonococcal arthritis and 4 of the 5 cases of chronic gonococcal arthritis were cured.

Many clinicians familiar with the therapeutic results of this method believe that the improvement or cure of the infection depends in great measure on the intensity of the reaction and the processes associated therewith.

In one military cantonment where intravenous injections of gonococcal protein were used in gonococcal epididymitis the results were most gratifying. The cessation of pain was nearly always complete within twenty-four hours after a properly reacting protein injection and the average stay in the hospital was five or six days. At the end of this time there was usually a marked reduction of the local swelling, beginning with the subsidence of the pain. In some instances of gonorrhoeal epididymitis it was necessary to give a second injection to obtain the desired results. There were two distinct groups of such patients. One apparently derived no subjective or objective benefit from the first injection but responded well to the second from twenty-four to forty-eight hours later, while the other group obtained relief after the first injection, but the effect was only temporary. In some instances members of the second group also obtained complete and permanent relief after a second injection. If the second injection was not beneficial, it was thought best not to continue the treatment.

In studying the reaction following the injection of various bacterial suspensions in cases of gonorrhoea Culver used as controls non-gonorrhoeal patients suffering from chronic skin lesions such as psoriasis, chronic eczema, and recurrent pyogenic infections. Apparently temporary cures were obtained in 3 cases of psoriasis and 2 of chronic eczema, while permanent recovery was obtained in 3 instances of chronic pyogenic infection of the skin.

G. E. BEILBY.

**Kahn, R. L.:** A Simple Method for the Removal of Natural Amboceptor from Human Sera. *J. Lab. & Clin. Med.*, 1921, vi, 218.

Judging from recent discussions on the removal of natural amboceptor from human sera, it appeared to Kahn that the problem involved was not whether the removal of amboceptor was essential for correct Wassermann tests, which seemed to be definitely established, but the fact that there is apparently no simple method of removing amboceptor which meets the requirements of laboratories performing large numbers of tests daily.



The proposed method for the removal of natural amboceptor from human sera was applied to 10,000 Wassermann tests and in the author's opinion meets the requirements of laboratories performing large numbers of tests daily. In a laboratory making from 70 to 130 daily examinations the delay due to the method was practically negligible.

Kahn's method is based on the well-known affinity of sheep cells for antsheep amboceptor, and consists of adding packed sheep cells to inactivated serum in the proportion of one drop per cubic centimeter of serum and permitting the extraction to take place for ten minutes at room temperature. The packed sheep cells employed were part of the same cells which after proper dilution were used in making the sheep cell suspension for the Wassermann tests. A quantity of sheep cells were washed daily in order that several extra cubic centimeters of packed cells would be available for the absorption of amboceptor. The drop employed was somewhat smaller than the ordinary drop, 1 c.cm. containing from 25 to 30.

As soon as the serum tubes were taken out of the inactivating bath they were lined up in such a manner that variations in the quantities of the sera could be observed easily. A drop of packed sheep cells was then placed in each tube containing approximately 1 c.cm. and shaken gently. In the tubes containing less than 1 c.cm. a part of a drop was permitted to touch the inner side of the tube and the serum was brought into contact with the cells by slightly slanting the tube.

Just as soon as the cells had been added to all the sera, the tubes were inserted in centrifuge holders, balanced, and placed in the centrifuge. By this time the ten-minute extraction period was usually completed. The centrifuge was then started and permitted to run from six to eight minutes. During this period a series of clean tubes were numbered so that they corresponded to those which were in the centrifuge. After centrifugalization, the clear supernatant sera were poured into the newly numbered tubes and were ready for use in the Wassermann tests.

In order that an amboceptor removal method may have wide acceptance it must first be proved efficient, it must not render the sera anticomplementary, and it must not be unduly time-consuming.

The efficacy of the simple procedure described was based on studies carried out in the laboratory on the rate of absorption of amboceptor by packed sheep cells at various temperatures. The author plans to present a complete report of these studies in another paper. In this article he states merely that when an ordinary drop of packed sheep cells was added to 1 c.cm. of serum containing 200 units of amboceptor this small quantity of blood absorbed as many as 160 units of amboceptor in five minutes at room temperature. The employment of a ten-minute absorption period in his procedure, therefore, gives a sufficient margin of safety for the absorption of far more amboceptor than is apt to be present in human serum.

In order to overcome anticomplementary properties which sera acquire after prolonged extraction with red cells at incubator temperature, Rossi suggested a procedure for amboceptor absorption at low temperature. This worker employed chilled centrifuge tubes, chilled corpuscles, and centrifugalization in the cold (during warm weather) after the extraction mixture had been placed in the ice chest for thirty minutes. The difficulty of applying this method on a comparatively large scale is very evident.

Regarding the time-consuming element of the procedure described, the author states that it took less than five minutes to add 100 drops of sheep cells to the same number of serum tubes; ten minutes to balance the tubes for centrifugalization; ten minutes for centrifugalization; and ten minutes to pour the supernatant clear sera into other tubes. These steps were carried out by one worker while another was attending to the dilution and titration of complement. It was evident that the delay caused by this absorption procedure in the completion of the daily tests was very insignificant.

G. E. BEILBY.

#### BLOOD

**Block, F. B., and Goldberg, S.: Mesenteric Embolism in a Hæmophilic.** *Ann. Surg.*, 1921, lxxiii, 229.

Block and Goldberg report a case of mesenteric embolism in a hæmophilic which almost cost the patient her life at a time when she was just beginning to show signs of recovery.

The patient, a woman 45 years of age, was admitted to the hospital September 10, 1920. She complained of acute general abdominal pain. On the day before admission, after the ingestion of food, she felt nauseated, and on the same evening a sudden severe abdominal pain developed which was cramp-like in character. This pain became aggravated and was associated with almost continuous vomiting. The vomitus at times consisted of greenish material and at other times was very foamy but had no characteristic odor and did not contain blood. Constipation was present although magnesium sulphate and an enema had been given. Bleeding from the rectum was noticed for the first time twenty-four years previously. The patient states that this was profuse and continued intermittently for two years, then stopped for several years, and finally recurred. The last attack was five years before her admission to the hospital and lasted about two years, causing such weakness that she was scarcely able to walk. This bleeding was always associated with pain and the condition had been diagnosed as intestinal ulceration.

On physical examination no rigidity of the abdomen was found, but there seemed to be a moderate amount of tenderness in the lower left quadrant. The pain, which was general, was also much more severe in this region. No mass or distention was noted.



The condition was diagnosed as either mesenteric embolism or volvulus of the sigmoid. Immediate operation was advised.

The opening of the abdomen was followed by a gush of blood-stained fluid and the prolapse of a moderately distended intestine into the wound. When the hand was passed down to the left lower quadrant a firm mass was felt which proved to be the ileum intensely congested and on the verge of necrosis. The mesentery of this portion of the gut showed infarction. The involved area of gut was about 6 in. in length. Below the diseased area the intestine appeared quite normal, while above it showed graduated degrees of congestion which was most marked near the area of infarction.

The diseased loop, together with several inches of the congested gut above the infarction and the accompanying mesentery, was removed. The open ends of the gut above and below the resection were inverted and closed and a lateral anastomosis was made. The operation was completed by attaching the omentum to the side of the anastomosis. The abdomen was closed without drainage.

During the closure of the superficial tissues a slow but continuous oozing of blood occurred. As the origin of this bleeding could not be determined, the patient was given an injection of normal horse serum on the table and the wound was closed with particular care and firm pressure against it. Despite these precautions the oozing continued for twenty-four hours, and the usual local hæmostatics were of no avail. A transfusion was then performed by the citrate method, about 20 oz. of blood being given. Almost immediately the bleeding stopped, and aside from a well-marked reaction due to the transfusion the patient's condition became markedly improved. She made an uneventful recovery.

The authors believe that the condition was an arterial obstruction and that it could not have been a thrombosis inasmuch as the blood had not sufficient clotting power to cause normal coagulation, much less the abnormal coagulation of a thrombosis. Another question worthy of conjecture is whether the intestinal hæmorrhages from which the patient had suffered in the past were due to hæmophilia or to another attack of mesenteric embolism which finally became cured spontaneously. The conclusions drawn are as follows:

1. Sudden and persistent vomiting without apparent cause associated with recurrent, severe abdominal cramps should call for early abdominal exploration.

2. If the patient is in reasonably good condition, wide resection of the infarcted area with lateral anastomosis is the operation of choice.

3. Hæmophilic manifestations should be combated at the earliest moment by the transfusion of at least 500 c.cm. of normal blood. No time should be wasted on horse serum, thromboplastin, etc. if results are not obtained therewith within an hour or two.

M. I. MALONEY.

**Giffin, H. Z., and Szlapka, T. L.: The Treatment of Pernicious Anæmia by Splenectomy: Second Report.** *J. Am. M. Ass.*, 1921, lxxvi, 290.

The review made by the authors covers 50 cases of pernicious anæmia in which splenectomy was performed. All of the operations were done more than three years previous to the report. The operative mortality in the series was 6 per cent. Ten patients (21.3 per cent) of those who recovered from the operation survived splenectomy three years or longer. Five patients (10.6 per cent) of those who recovered from the operation survived splenectomy for more than four and one-half years and are still living. The total length of the history in these 5 cases averages almost six years.

It may be stated with a reasonable degree of accuracy that in addition to the immediate remission which occurred constantly following splenectomy, this operation prolongs life in at least 20 per cent of the cases operated on at the Mayo Clinic.

No particular pre-operative characteristics of the disease appear to be indicative of favorable results following splenectomy. However, in the type of case in which there is evidence of active hæmolysis the patient shows a more marked immediate improvement.

Splenectomy may be recommended for cases of pernicious anæmia when, in view of all of the circumstances, personal as well as medical, the possibility of prolonging life appeals to the family and to the patient. Occasionally it may be performed in order to bring about an immediate remission of symptoms.

**Love, G. R.: Autotransfusion for Hæmorrhage.** *Med. Rec.*, 1921, xcix, 58.

The therapeutic value of blood transfusion as a means of stopping hæmorrhage was discovered early in the practice of blood transfusion as it was observed that when the treatment was given for hæmorrhagic anæmia the hæmorrhage itself was often checked. The clinical data to this effect have been abundant but there has been a considerable paucity of experimental data.

Citrate for some time received the credit as the therapeutic agent in transfusion for hæmorrhage. However, since the transfusion of whole blood, as by Lindemann's method, had the same effect, it was obvious that the therapeutic action of the transfusion was due to the transfused blood itself. Although this phenomenon was not definitely explained, the fact that the blood was brought into contact with a foreign surface was considered responsible. In a transfusion the recipient receives blood which is in a precoagulative state and therefore it coagulates more easily when it is exposed the second time, that is, at the point of hæmorrhage. It was obvious that in hæmophilia the deficient substances necessary for coagulation were supplied by the donor.

Lewishon observed that the coagulation time was reduced even by autotransfusion, and stated that a 300 c.cm. autotransfusion on a dog reduced



the normal coagulation time of five minutes to ten seconds. Although the author's results did not approach Lewishon's data, they indicated the same fact, and the difference, he believes, may be explained by the technique and methods used in determining the coagulation time. It was Love's experience that blood which in ten seconds would form a visible coagulum was originally in the last stages of coagulation. In view of these facts, autotransfusion was studied more extensively with an improved method of determining the coagulation time.

Any of the ordinary methods of transfusing whole or citrated blood may be used for autotransfusion, but the method which the author found easiest and most applicable was as follows:

A tourniquet was applied above the field and the vein was punctured with a short 15 to 18 gauge needle in the usual manner. The blood was aspirated into a 10- to 20-c.cm. Luer syringe to the capacity of the syringe. The tourniquet was then released and, with the syringe still connected, the blood was injected back again. This process was continued until the amount of blood handled was equivalent to, or greater than, an ordinary transfusion.

Experiments were carried out by tracheotomy on three dogs under ether anaesthesia. The coagulation time was determined both by the capillary tube method described by the author and the test-tube or Hayem's method as these two procedures represent two extremes. In the capillary tubes the area of contact between the blood and the foreign surface is very great, while in the paraffined test tube it is minimal. Consequently the percentage reduction of the coagulation time was greater in the test tubes than in the capillary tubes after the autotransfusion. However, the test-tube method was by no means accurate even when triplicate tests were averaged.

Five other similar experiments were performed with the same general results. There was some deviation in the duplicates but this was to be expected in experiments with so many factors. The actual hæmorrhage in each instance lessened the coagulation time. Several attempts were made to determine the actual bleeding time before and after autotransfusion by irrigated foot pads, lacerated wounds, and incised wounds. This type of experimentation was finally abandoned, however, because it was impossible to obtain a constant normal for comparison. Many factors, such as the blood pressure, the contractibility of the vessels, rigidity and tension of the surrounding tissues, the size of the vessels, the amount of laceration, etc., entered into the determination of the actual bleeding time. Therefore it was evident that the relationship between the bleeding time and the coagulation time was not simple. However, in the study of the bleeding time, wounds which would ordinarily have bled very severely were easily controlled after autotransfusion.

Since all of the experiments were made upon normal blood, the adaptability of autotransfusion to the treatment of hæmorrhage when the coagulation time is abnormal was not determined.

G. E. BEILBY.

**Levison, L. A.: An Unsuccessful Result Following Transfusion with Immunized Blood in a Case of Infectious Endocarditis. *J. Lab. & Clin. Med.*, 1921, vi, 191.**

The treatment of various infectious processes by the transfusion of blood taken from donors who have been immunized against the bacterial agent involved has introduced a new therapeutic procedure which is now on trial. Within recent years there have been several reports of cases of this kind, but the scarcity of such instances and the variable conditions under which they were managed rendered a conclusion in regard to the value of the method very difficult.

Levison cites a successful result from the transfusion of immunized blood in a case treated by Little. The patient was a girl 11 years of age who had epidemic influenza complicated by laryngitis, pleurisy, suppurative glossitis, and finally a general septicopyæmia in which a staphylococcus and an unidentified bacillus were isolated from the blood. A vaccine was made and a donor immunized by giving an injection prior to the two last transfusions. Four transfusions were given in all. The septic temperature disappeared and the patient recovered. Little was of the opinion that in this case the therapeutic procedure described was life saving.

Levison reports also another case, that of a college student, 21 years of age. The illness for which he was treated began in March, 1920. At that time he had a sore throat but no definite attack of acute tonsillitis. The patient was examined several times during March at the medical clinic of the University of Michigan. Because of a heart lesion and fever he was requested to remain in bed for short intervals of time. The fever was not continuous, however, and he was therefore permitted to leave his bed and resume his student activities. He was confined to bed with fever for short periods three times during the month of March.

About the first of April the fever became more persistent and he was sent home from school and did not return. From that time he was confined to his bed continuously. Fever was a constant symptom and varied from 99½ to 103½ degrees. There was no regularity in the temperature curve but the afternoon temperature was usually the highest. The pulse ranged from 100 to 120. The respiratory rate was not increased. There was no evidence of cardiac decompensation such as œdema, dyspnoea, or cough. While lying quietly in bed the patient was fairly comfortable. There were no pulmonary symptoms and the gastro-intestinal tract did not give rise to any unusual trouble except that occasionally distress followed the ingestion of food. There were no urinary symptoms.



In the absence of any specific treatment for infectious endocarditis, symptomatic measures were employed throughout the illness. Injections of sodium cacodylate and intravenous injections of electrargol were without apparent effect. After the isolation of the streptococcus from the blood it was decided to prepare a vaccine from this organism, immunize a donor, and give the patient repeated transfusions of the immunized blood. A donor was selected in the person of a healthy, stout maternal uncle weighing 200 lb. Repeated injections of vaccine were given the donor prior to the first transfusion and continued throughout at intervals of four days. Four transfusions were given by the citrate method, from 500 to 600 c.cm. of blood at each injection. In all, 2,200 c.cm. were transfused within a period of five weeks.

Following the first transfusion there was a moderately severe reaction with a chill and a rise in the fever, but such reactions practically disappeared after the later injections. The effect of the transfusions was to increase the hæmoglobin content of the blood, raise the number of red cells, lower the number of leucocytes, and decrease the percentage of polymorphonuclear cells. The patient's strength was maintained by this procedure to a marked degree. However, there was no definite change in the temperature curve following any of the transfusions. At no time did the temperature remain normal for even one day. The pulse rate was not reduced. Hæmorrhage in the hip joint and embolism into the lung occurred during the period of time in which the transfusions were being employed, but did not directly follow any of them. On July 8 the temperature dropped to normal, but with it there was an increase of the pulse rate to 140. The patient became weaker and the pulse irregular. Death occurred July 10, the patient being comatose and the heart in fibrillation.

The author's suggestion that immunized blood transfusions be employed in this instance was concurred in by Hoover of Cleveland who stated that this procedure was theoretically logical. In view of the desperate nature of the illness and the lack of any known therapeutic aid, the patient was very willing to have the experiment attempted. The fact that the donor received the vaccine five times before the first transfusion with a reaction following each injection consisting of a temperature rise, chill, malaise, and an increase in the leucocytes was evidence that he did not respond to the vaccine or, in other words, was "immunized." The vaccine injections were continued in the case of the donor throughout the intervals between the transfusions. Whatever antibodies might have been produced by this procedure were introduced into the patient's circulation in the course of the subsequent transfusions. The experiment was carefully observed. Levison states without reservation that beyond the maintenance of the patient's strength and the relief of the anæmia the transfusions were of no avail.

G. E. BEILBY.

## BLOOD AND LYMPH VESSELS

**Webster, L. T.: Portal Thrombosis.** *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 16.

Welch, in his classical treatise on thrombosis, referred to occlusion of the portal vein as a "well-characterized although usually undiagnosed affection" caused most frequently by compression of the intrahepatic branches in cirrhosis, syphilis, or tumors of the liver or compression of the main branches or trunk by fibrous perihepatitis, chronic peritonitis, swollen lymph glands, impacted gall-stones, or tumors.

Two years before, Spiegelberg, in reporting a series of unusual autopsy findings, described a case with calcification in the wall of the portal vein. Borrmann at about the same time emphasized the importance of this condition. Sachs in his comparative study of arterial and venous sclerosis considered it a manifestation of general venous involvement.

Portal thrombosis, Webster states, is mentioned 21 times in the 6,050 autopsy records of the Johns Hopkins University. It was associated with cirrhosis of the liver in 7 cases, with carcinoma in 6 cases, with cholangitis in 4 cases, and with amyloid disease, ulcer of the stomach, Banti's disease, and pyelephlebitis in 1 case each.

In about 275 cases of cirrhosis of the liver, portal thrombosis was reported in 7 cases (2.6 per cent). Usually the main portal vein and its liver branches were involved. In every case in which a note was made as to the condition of the veins, sclerotic changes in the intima or media were mentioned. A slowing of the circulation plus an injury to the vessel wall seemed to be of the most importance in the etiology.

In cases of carcinoma of the stomach or head of the pancreas with metastases to the liver and retroperitoneal glands thrombosis of the portal vein was expected. Usually the main portal vein and its liver branches were involved. The thrombus was carcinomatogenous or hæmatogenous. Pressure occlusion of the lumen and injury to the vessel wall seemed to be the chief etiological factors.

In about 35 cases of cholangitis, portal thrombosis occurred in 4 (10.5 per cent). Usually the main portal vein and its liver branches were involved. Infection of the vessel wall, although not always definitely recorded, was assumed to play an important rôle in the etiology.

G. E. BEILBY.

**Baensch: Exact Indications in the Treatment of Lymphomata** (Ueber die exakte Indikationsstellung in der Lymphombehandlung). *Muenchen. med. Wchnschr.*, 1920, lxxvii, 1199.

As 88 per cent of all lymphomata are situated in the neck, it is of importance in every case to make a careful search for the portals of entry of the infection. In many instances carious teeth, hypertrophied tonsils with chronic suppuration, and eczema of the skin play an important part in the etiology of the condition. In such cases the causal factor



must first be removed. The condition will then often clear up of its own accord.

If the hypertrophy does not recede spontaneously, X-ray treatment is indicated as it gives excellent results after the removal of the focus of infection. In cases of true tuberculous lymphomata the infection occurs by way of the lymphatics or the blood stream. If single glands are infected they may be removed by operation. In severe cases radiation with the quartz lamp or natural sun combined with X-ray treatment is better. When the adenopathy is found in various parts of the body the infection is probably hæmatogenous. In such cases heliotherapy is indicated. If the tuberculous lymphomata are soft but still intact the author punctures them every eighth day and injects iodoform-humanol solution. At the same time treatment with the X-ray is given. In cases of granulating fistulæ benefit is to be obtained in some instances only by careful use of the sharp curette.

The author has had the opportunity to try out the various therapeutic procedures but obtained the best results with the method described.

WINIWARTER (Z).

**Reder, F.: The Result and Feasibility of Treating Lymphangioma with Injections of Boiling Water.** *Surg., Gynec. & Obst.*, 1921, xxxii, 70.

In the author's service of ten years at the City Hospital, St. Louis, he had occasion to observe only four cases of lymphangioma. Hospital care is seldom sought by persons with a true lymphangiomatous growth, evidently because these tumors seldom threaten life, they do not cause pain, and they do not cause the individual to feel ill. Lymphangiomata are usually congenital and the probability that a mother would take her baby to a hospital for a small tumor mass on its body which does not cause pain is rather slight.

When a surgeon is confronted with a tumor of any sort the thought uppermost in his mind is whether or not the growth is suitable for excision. Extirpation is the radical and most satisfactory measure in the treatment of a lymphangioma if the operation can be done safely. In cases of that form of nævoid lymphangioma which causes marked enlargement of the tongue and forces it to protrude from the mouth, partial removal by a cuneiform excision is the only measure, even though there is risk of causing progressive inflammation or lymph fistulæ. A similar procedure, but one associated with greater risk, may be undertaken when the disease has attacked the lip.

In comparing the results obtained in cases of lymphangiomata with those obtained in cases of hæmangiomata it must be said that they have been somewhat disappointing. This must be attributed to the difference of the fluids in the two types of tumor. So far, 8 cases have been treated with injections of boiling water. The reaction following the injection seemed unusually severe when compared with that following the injection of a hæmangioma. For twenty-four hours the patient gave evidence of

feeling sick and usually registered a temperature of 100 to 101 degrees with a pulse of 100 to 110. When the reaction had passed off, which was generally after the third day, the feeling of euphoria returned. The increase in the size of the tumor after the injection, although considerable, bore a minor ratio to the increase seen in hæmangiomata after injection. Inflammatory processes seemed active and prolonged, the skin giving evidence of their severity by a marked reddish discoloration. Retrogression seemed very slow. No decrease in the size of the tumor was noted before four to six months. In the case of a baby with the left foot about four times its normal size it required two years for the foot to attain a size to be fitted with a shoe. Subsequent injections are almost impossible if the initial injection has been thorough. The tumor mass is so hard that hot water cannot be forced into it.

Of the 8 patients treated with injections of boiling water all were benefited, but in no case has the tumor entirely disappeared.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Jones, H. M.: A Simple Device for Measuring the Rate of Metabolism.** *Arch. Int. Med.*, 1921, xxvii, 48.

The recent test devised to measure basal metabolism is a particularly valuable test to the clinician. The problem of making the test available to clinicians not having access to the elaborate equipment of the nutrition laboratory was solved by Benedict who designed a portable apparatus for measuring the basal metabolism of human subjects, and by Du Bois who has devised a "linear formula" for use in indirect respiration calorimetry. To extend its usefulness still further by reducing to a minimum the expenditure of time, labor, and equipment, Jones has devised an apparatus which is simple and accurate in operation and yet sufficiently compact for the surgeon, clinician, or general practitioner to carry it to the patient's home or bedside, an apparatus which is portable in a practical sense.

This apparatus consists merely of a mouthpiece with a wide flexible tube leading the expired air into the apparatus; a tower of small pieces of charcoal soaked in alkali to remove the carbon dioxide; a gas anæsthetic rubber bag to allow for expiration and inspiration and to contain the oxygen supply; a piece of aluminum pipe to serve as a support for the alkali tower and also as a measuring apparatus for delivering into the rubber bag a known quantity of oxygen. The measuring cylinder is provided with an attachment for the small 40-gal. oxygen cylinder and a pressure gauge with a special dial to indicate when the desired quantity of oxygen has been released.

The instructions which have been found to cover the points in technique and the principles of the method sufficiently to enable one of ordinary skill to carry out the test are briefly as follows:



1. Have the subject take no food for from fourteen to eighteen hours previous to the test, preferably from the 6 o'clock evening meal to 10 o'clock the next morning, when the test is to be made.

2. The subject should be lying comfortably and quietly from fifteen to thirty minutes before the test is begun.

3. Attach the nose clip and test for air leakage at the nose by having the subject close the mouth and exert moderate pressure. Turn the three-way cock open to the air. Insert the rubber shield of the mouthpiece inside of the lips but outside of the teeth, drawing the lips up about the neck of the mouthpiece. Open the needle valve of the measuring cylinder. Admit the gas slowly from the oxygen tank until the bag distends sufficiently to just touch the side of the alkali tower. Then close the needle valve. Admit the gas slowly again from the oxygen tank while the indicator is driven around, and until, after tapping the gauge with the finger, it stands exactly over the room temperature point on the scale of the dial. When released later, this quantity will be 1,000 c.cm. ( $\pm 2$  c.cm.) of gas at 760 mm. Hg. The gas is held in the measuring cylinder ready for release at the beginning point. Approximately at the beginning of expiration quickly turn the three-way cock closed. The subject is now breathing the gases confined in the tower and bag. Observe the quantity of gas in the bag as it gradually diminishes in volume. Watch the point where the bag makes contact with the side of the alkali tower. The expiration which occurs when the bag at its fullest distention just fails to touch the side of the alkali tower is counted as 1. If the expiration following fails to cause the bag to touch the alkali tower it is counted 2. The expiration following this is 3.

This establishes a beginning point. At this instant release the stop-watch and then discharge the 1,000 c.cm. of gas now in the measuring cylinder by opening the needle valve. Close the needle valve again and admit a second liter of gas into the measuring cylinder. After a few minutes the bag will have again diminished in volume to the condition described for the beginning point, i.e., three successive normal expirations, when the bag at its fullest distention just fails to touch the side of the alkali tower). Watch for this as before, and when it occurs, note the time by the stop-watch. Release the second liter to the bag as before. Close the needle valve again and admit a third liter to the measuring cylinder. Continue in this way, observing the exact time required by the subject to consume each successive liter. Two liters are usually sufficient but the average of three is better. Finally, at the end point of the last liter used, stop the watch, turn the three-way cock to open, and remove the mouthpiece. Before removing the nose clip, test again for air leaks as at the beginning of the test. The total time on the watch divided by the number of liters consumed equals the average time required to consume one liter, and by this the subject's rate of metabolism is made known.

Mathematical procedures necessary for the calculation of the rate of metabolism (from the respiratory quotient, the body area, and the rate of oxygen consumption) are eliminated from the test. The reading is made directly in terms of calories per hour per square meter of body area.

Independent and comparative tests show the technical variations of the method to be within physiological limits and therefore it meets the needs of the clinician as an instrument for measuring basal metabolism.

M. I. MALONEV

**Hirsh, A. B.: Diathermy in Some Bone Lesions.**  
*Surg., Gynec. & Obst.*, 1921, xxxii, 74.

The general application on a large scale of physical treatment methods to the whole range of conditions met in war hospitals has called attention to the applicability of such methods to industrial injuries and their sequelæ. The use of thermo-penetration in certain wound sequelæ has been so general that a clinical discussion of its application is opportune. The selection of this method is based on the well-known fact that between the two active electrodes there occurs molecular friction massage which causes a definite warming of the tissues with an increase in the arterial blood supply, improvement in the metabolism, and greater phagocytosis. The result is a favorable influence on the disease processes. No attempt is made to draw final conclusions or even to determine specific indications for or against physical treatment; the sole object of this article is to point out the results so far achieved as an incentive for further investigation.

Several illustrative cases are cited in detail to show average results obtained with diathermy in conditions of fracture with non-union and osteomyelitis. In one of the cases, the application of a current of 800 to 1,000 ma. (subsequently increased to 1,200 ma.) passing from Crooke's metal "cuff" electrodes along the affected extremities produced unquestionably good results as revealed by successive roentgenograms. Another case also showed a gratifying result. Three cases of osseous non-union and osteomyelitis were only slightly benefited by diathermy.

Certain facts as to this valuable current should be thoroughly grasped by the operator in order that it may be employed accurately. One must be sure that the apparatus employed is really scientifically constructed so as to produce genuine resonance between its component parts as otherwise the absolutely necessary quality of d'Arsonval current is not obtained. Then, during its operation, one must frequently note the tone of the latter so as to avoid its shifting to a thermofaradic or an irregularly interrupted high-frequency current which might prove irritating instead of soothing. This is of importance when pain is a factor in a case. Again, where newly formed callus is to be acted on by diathermy, as after bone inlays or in cases of ununited fracture, it is well to recall that applications of excessively high amperage (even if not of too great



volume, but when too frequently repeated) may have an actually destructive action on recent callus. Indeed, such frequently applied high amperage diathermy is distinctly indicated where the deposit of callus becomes so bulky as to interfere with normal function. It is in this way that new bone formation may usually be controlled directly.

In conclusion, the author states that because of the undisputed fact that diathermy brings about a marked enlargement locally of existing blood vessels, if not an actual growth in their number, and on the basis of the cases reviewed, it is reasonable to anticipate a greater or less increase of bone deposit in cases of delayed union or bone graft, removal of osteomyelitis, cessation of infection, and closure of the cavity by granulation.

ADOLPH HARTUNG.

**Walker, J. W. T.: An Address on the Part of the Practitioner in the Treatment of the Pre-Operative Stage of Enlarged Prostate.** *Brit. M. J.*, 1921, i, 71.

The author discusses the various risks to which the patient with hypertrophy of the prostate is subject. Postoperative distention of the bowel is a not uncommon complication and ranges in severity from mild flatulence to prolonged distention which ends fatally because of pressure on the diaphragm. It occurs occasionally as an acute condition and is rapidly fatal. Operations on the kidney also may be followed by distention. Dilatation of the colon may result from a local paralysis consequent to the extension of a perinephritis to the contiguous wall of the colon. Distention following prostatectomy is explained in a number of cases by the decrease in kidney function resulting from back pressure. Flatulent distention of the bowel due to intestinal fermentation and exhaustion of the sympathetic nervous system resulting from uræmia, intestinal toxæmia, or shock are two important elements in the causation.

Certain types of patients who are especially liable to postoperative complications of the bowel should be given several weeks of treatment before operation. Oral sepsis should be eradicated, especially in the sallow, thin, dyspeptic individual. In the cases of fat, flabby persons accustomed to eating too much rich food the diet should be regulated and antiseptic treatment of the bowel administered.

Castor oil given three days after operation prevents straining which might cause hæmorrhage. If distention of the abdomen or vomiting occurs after operation an immediate purge is indicated. In cases of persistent distention of the stomach gastric lavage should be given. High rectal enemas and tubal drainage of the rectum for several hours are often beneficial.

Postoperative pneumonia is often due to focal sepsis. Patients with chronic bronchitis are generally poor operative risks. For such patients spinal anaesthesia is indicated; the Trendelenburg position should be avoided and the patient kept sitting up in bed after the operation.

Postoperative hæmorrhage is a very common sequela following prostatectomy on patients with high blood pressure. Although bleeding is usually endured very well, it may cause a fatal fall in the blood pressure. Compensated valvular lesions do not contra-indicate prostatectomy. Anæmic patients do not bear loss of blood at operation and are less liable to survive other postoperative complications, such as bronchitis, bowel distention, and septic conditions. Sepsis in the urinary tract is often a cause of the anæmia and may be cleared up by preliminary drainage of the bladder; this makes it possible to perform the prostatectomy with only an average risk. In some cases direct treatment of the anæmia is necessary.

In the cases of tabetic patients with enlarged prostates it is necessary to determine whether the urinary difficulty is due to prostatic obstruction or atony of the bladder wall. When atony is the cause nocturnal incontinence is an early symptom and may occur when only a few ounces of residual urine are present. Frequency, especially nocturnal, is indicative of prostatic obstruction. Hypertrophy of the prostate generally does not occur in patients under 50, but bladder symptoms due to nerve lesions may be present earlier in life. In cases of lesions of the spinal cord the bladder often shows many fine trabeculations which are in contrast to the few thick cord-like bands found in cases of obstruction. When in the case of a tabetic patient the residual urine is due to an enlarged prostate, prostatectomy gives an excellent result.

Urinary retention and infection present considerable danger. Patients with chronic retention often pass merely the overflow urine; they are mildly uræmic and should be treated carefully. The bladder should be emptied slowly, care being taken to prevent infection. The patient should then be given a retention catheter, but suprapubic drainage is necessary if he does not respond readily to the latter.

The author gives several indications for prostatectomy. Prostatic hypertrophy is a progressive disease; some adenomatous prostates become malignant; the mortality among patients with permanent catheters is higher than that following prostatectomy. Many deaths after prostatectomy are due to the sepsis caused by pre-operative catheterization or the back-pressure and renal insufficiency consequent to the delay in submitting to operation.

A. J. SCHOLL, JR.

#### EXPERIMENTAL SURGERY AND SURGICAL ANATOMY

**Willis, A. M.: The Alkali Reserve in Abdominal Infection and Its Relation to the Leucocyte Count.** *J. Am. M. Ass.*, 1921, lxxvi, 303.

The significance of acidosis is not clearly understood. Some accord it the importance of a clinical entity, viewing the reduction of the reserve alkali as the cause of the various pathologic changes



associated with it. This has been by no means proved for there is evidence that so-called acidosis is itself merely one of the results of a common cause. Apparently favorable results do not always follow the use of alkali therapy, even in the presence of a marked reduction of the reserve alkali. A number of authors have called attention to the dangers which attend the intravenous injection of sodium bicarbonate in cases of acidosis and the author has failed to observe any benefit which he could attribute to the action of the soda. During the course of experiments he recently carried out in producing peritonitis in dogs Willis noted that a considerable number of the animals which died had convulsive seizures shortly before death. As an excess of alkali in the blood may cause convulsions this fact suggested that possibly there might be an actual increase in the alkali instead of a reduction as formerly supposed.

In order to answer this question a study was made of the blood of seven dogs which died of peritonitis and of one dog which was critically ill with the condition but eventually recovered. The reserve alkali was estimated by the method of Van Slyke and Cullen for determining the carbon-dioxide combining power of the plasma. The carbon-dioxide combining power of the seven animals which died varied from 43.8 to 53.6 volumes per cent before any operative procedure. Three of these dogs showed the reduction of the reserve alkali at the last determination which was made a short time before death. The remaining four dogs all showed an increase in the alkali as death approached.

The author had the opportunity also to examine the blood of three patients under his care. The results obtained seemed to indicate that acidosis is not an important factor in the course of peritoneal involvement. If it is permissible to draw conclusions from this small number of experimental and clinical observations, it would seem that there is no indication for the use of sodium bicarbonate in cases of peritoneal infection. Certainly there is no justification for routine alkali therapy. Such treatment should be limited to cases in which appropriate tests have demonstrated a reduction in the reserve alkali to a point beyond which harm may result. Even under such conditions the results to be obtained are problematical.

G. W. HOCHREIN.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Williams, J. G.:** Two Unusual Chest Cases. *Am. J. Roentgenol.*, 1921, n.s. viii, 31.

Case 1 was a case of hysterical aphagia with loss of sensation in the pharynx and larynx which permitted food to pass into the trachea and bronchi. Two ounces of bismuth meal given the patient to swallow was seen to enter the trachea and bronchi of both lungs without causing distress or exciting immediate cough. Stereoscopic plates showed the mixture extending well out into the smaller bronchi of both lower lobes. Some few hours later the

patient coughed up much of the bismuth and after two days no trace remained.

Case 2 was that of a man whose stomach was located entirely above the diaphragm in the posterior mediastinal space and somewhat to the right of the median line. The oesophagus reached to about the second interspace and was considerably distended as was observed in an examination made with the aid of an opaque meal. The stomach was practically normal in shape but on its lesser curvature just above the incisura was a slight projection which was diagnosed as a penetrating ulcer or adhesion. There was marked gastric stasis due to constriction of the small intestine at the opening in the diaphragm and pyloric spasm caused by the lesion on the lesser curvature. No history of trauma or acute abdominal crisis was given in this case. The conclusion was drawn that the stomach had passed through one of the normal openings in the diaphragm, most probably the oesophageal, and had carried the oesophagus up into the chest with it. ADOLPH HARTUNG.

**Boggs, R. H.:** The Treatment of Carcinoma of the Breast by Embedding Radium Supplemented by X-Ray. *Am. J. Roentgenol.*, 1921, n. s. viii, 20.

Radiation for the treatment of carcinoma of the breast has been so changed by the embedding of radium that where formerly only superficial skin effects were produced, today cancerous tissue deeper than that which can be removed by the knife may be destroyed without opening the lymphatic chains. From two to four weeks before embedding radium the author gives surface applications in the axilla and over the glands below the clavicle, and a complete course of heavy filtered roentgen-ray treatment to the breast and all the glands draining it. This treatment checks cell proliferation and lessens the danger of metastases when the breast and adjacent lymphatics are incised and radium is inserted. By embedding the radium a lethal dose may be given without affecting the skin. The subcutaneous tissue will tolerate from three to five times as much radiation as the skin.

The method described is a step in advance in the treatment of carcinoma of the breast, but as the number of cases to which it has been applied is small and as the length of time since the treatment was given is short, Boggs feels warranted in discussing only the temporary results. Even in some of the advanced cases the disease in the breast and the glands appears clinically to have retrogressed. By embedding radium throughout the entire breast, in the axilla, in the glands leading from the breast to the axilla, and in the glands below the clavicle, it is now possible to make radiation for carcinoma of the breast as thorough as a radical dissection without opening the lymph channels. The radium treatment is made even more effective if it is supplemented by Coolidge roentgen-ray treatment to the twenty or more lymphatic chains draining the breast, using 10 mm. of aluminum and cross-firing as much as possible. ADOLPH HARTUNG.



**Kirklin, B. R.:** The Rôle of the Roentgen Ray in the Diagnosis of the Surgical Abdomen, with Special Emphasis on Its Use in the Gall-Bladder and Appendiceal Regions. *J. Indiana M. Ass.*, 1921, xiv, 1.

Since in comparatively few cases of pathologic gall-bladder or chronic lesion of the appendix the clinical findings are sufficiently characteristic to warrant a positive diagnosis all available diagnostic methods should be used. Among these the roentgen examination offers invaluable assistance. In cardiospasm, gastric, duodenal, or jejunal ulcer, pyloric stenosis, gastric or intestinal neoplasm (with the possible exception of carcinoma of the rectum), urinary calculus, intestinal obstruction, gastropnoxis, enteroptosis, and nephroptosis, the roentgen-ray findings, if correctly interpreted, are of more value than those of any other one diagnostic method at our disposal.

In the diagnosis of gall-bladder conditions, the improved technique now in use combined with the better interpretation of shadows has made it possible to discover lesions in a great percentage of cases. During the past eighteen months the author has been able to show with the X-ray over 90 per cent of the pathologic gall-bladders which later came to operation. Gall-stones containing much calcium are easily demonstrated but are greatly in the minority. However, most gall-stones have sufficient calcium within them or encrusted upon them to render them visible in a very carefully made roentgen examination. When they are not found, a barium meal may be of great assistance in revealing the presence of the pathologic gall-bladder. Hepato-fixation of the stomach, localized tenderness to the outer side of the duodenal shadow, visualization of a Riedel's lobe of the liver, an unusually high position of the hepatic flexure of the liver, and unusual visibility of the duodenum, all tend to indicate gall-bladder pathology. Since positive diagnoses may be made in so many cases, a negative diagnosis is of considerable significance.

In cases of lesions of the appendix the comparison of the roentgen and operative findings has given gratifying evidence of the value of the X-ray in the diagnosis. Occasionally in acute cases the roentgen examination may be of value in differentiating the condition from urinary calculus or carcinoma of the cæcum, and if the pain is on the left side it may reveal situs inversus. It is in the chronic cases, however, that the roentgen ray offers greatest assistance. Every normal appendix, with the possible exception of atrophic appendices in old persons, will fill with the barium meal. Irregularity of the appendiceal lumen, fixation, stasis, and localized tenderness point to deviations from the normal. Ileal stasis is a frequently associated condition.

In the routine examination of abdominal lesions several plates are made of the gall-bladder and also of the kidneys if there is any doubt regarding the condition of the latter. The chest is then examined with the fluoroscope and if anything at all suspicious

is noted a set of stereoscopic plates is made for further study. At this time the patient is given the opaque meal and after the stomach and duodenum have been carefully studied under the fluoroscope, several plates are made. The patient is then asked to return at the end of three, six, eighteen, and twenty-four hours for further observation. If part of the meal is still present at the end of twenty-four hours he is asked to return again until all possible information regarding his condition is obtained. If indicated, an opaque enema is also given and a careful fluoroscopic and plate study of the colon is made.

In conclusion the author states that by the skillful use of roentgen methods alone it is possible to diagnose from 80 to 95 per cent of pathologic gall-bladders and appendices. As in all other branches of roentgenology, the most important factor in this work is the correct interpretation of the various shadows seen on the roentgen plates and screen. Conservatism is necessary in interpreting the roentgen findings, for over-enthusiasm is very apt to lead to incorrect conclusions.

The article is concluded with a report of the roentgen and operative findings in several cases.

ADOLPH HARTUNG.

**Van Zwaluwenburg, J. G., and Peterson, R.:** Pneumoperitoneum of the Pelvis: Gynecological Studies. *Am. J. Roentgenol.*, 1921, n.s. viii, 12.

This study was made primarily to furnish illustrations to demonstrate in clinical lectures the anatomical relationship of the normal and pathologic pelvis, but developments suggested that the method may have a diagnostic value as well. Full details of the technique employed are given. The examination is made by stereoscopic plates taken with the patient in the knee-chest position immediately after the injection of from 1½ to 2 liters of carbon-dioxide gas. The central ray is directed in the long axis of the pelvis.

The normal pelvis is rather easily freed of all intestinal coils with the exception of that portion of the pelvic colon and rectum which has no mesentery. The shadow of the rectum is closely applied to the anterior surface of the sacrum well above the shadows of the female generative system and hence offers no confusion. When other intestinal coils were visualized, the conclusion that pathologic adhesions were present seemed justified. Ordinarily both anterior and posterior pelvic pouches are empty of everything but gas. In the presence of pathology, either the one or the other may be filled with inflammatory exudate or adhesions, incarcerated bowels and omentum, and there is consequent displacement of the uterus and the broad ligaments which form the transverse partitions of this portion of the pelvis. Such displacement with obliteration of either of the pouches is one of the most striking features of inflammatory pelvic disease.

When the bladder is entirely empty, its shadow is scarcely recognized on the posterior surface of the pubic bone. When it is distended, however, it may



be seen as a rounded shadow of no very great saliency exactly where one would expect to find it, and its recognition is never a matter of great doubt.

When the patient is properly placed the fundus of the uterus is separated from the bladder shadow by the space of the anterior or uterovesical pouch which normally contains gas. In the presence of marked relaxation of the pelvic floor and when the position is not satisfactory, it may lie on the posterior surface of the bladder and may be exceedingly difficult to recognize. On either side of the uterine shadows are seen the narrow linear shadows of the broad ligaments clearly spreading out at either end, centrally embracing the uterine shadow and peripherally fusing with the pelvic wall. Where the uterus is displaced or distorted, these broad ligament shadows indicate its position. They are best seen at a level somewhat above that of the cervix but well below the equator of the fundus.

The authors were unable to localize the round ligaments definitely. Neither were normal tubes seen as separate or recognizable shadows but were probably component parts of the broad ligament shadow. When distended or inflamed, however, they become conspicuous as tortuous shadows on the posterior surface of the broad ligament shadows, possibly obliterating them by overriding, or as pear-shaped shadows in the posterolateral portions of the pelvis. In chronic cases the picture may be much confused by the overlying intestinal coils. The distortion produced may make it difficult to recognize the shadow of the uterus and almost invariably the posterior cul-de-sac is much contracted and encroached upon by what appears to be inflammatory tissue and cicatrix.

The normal ovaries apparently are not visible, being hidden by the uterine shadow. However, in cases of retroversion and "prolapse of the appendages" ovarian shadows are very conspicuous. Ovaries containing small cysts have been recognized as ovaries although the cystic element was not recognized. Larger ovarian cysts produce a variable picture which is more or less characteristic.

Enlargements and tumors of pelvic organs cast conspicuous shadows but the paucity of the available data has made it inadvisable to formulate any comprehensive rules for their differentiation.

In conclusion the authors state that diagnosis based on this method as developed to date is far from easy or accurate. They express the hope that a continuation of these studies will furnish reliable criteria for interpretation and eventually establish its legitimate application to selected cases. ADOLPH HARTUNG

### MILITARY SURGERY

**Lecène, P.: The Present Standards in the Treatment of War Wounds** (Conditions actuelles du traitement des blessures de guerre). *Presse méd.*, Par., 1921, xxix, 81.

According to Lecène, the theoretical formulæ upon which the treatment of war wounds is based are as follows:

1. Every wounded man should be placed as quickly as possible under the care of a competent surgeon.

2. In almost all cases an operation should be performed as soon as possible after the receipt of the injury.

3. All perfected techniques and methods of modern surgery should be applied to war surgery.

4. The wounded should be cared for until recovery by the same surgeon.

While these are essential principles of war surgery, there are many difficulties in putting them into practice because of the exigencies of war. The first difficulty is due to the large numbers of the wounded, while a second arises from the instability of the zone of military operations and the insecurity of advance-zone hospitals. To meet the first difficulty modern armies must be provided with an extremely numerous and thoroughly equipped surgical personnel which is easily transportable, and with the means to facilitate rapid examination, selection, surgical treatment, and evacuation of the wounded according to the gravity of their condition. To meet the second difficulty war surgery must be able to adapt itself to varying circumstances by changing the organization of surgical teams and by changes in technique and the methods of treating the wounded. The war surgeon must know not only what it is best to do under any circumstances but also what is the best that can be done under particular circumstances.

The most trying conditions in war surgery are met when surgical formations must move rapidly with a retreating army. Operations must then be limited to immediately urgent cases (ligations, amputations, and resections, the treatment of shock, and very urgent thoracic and abdominal wounds). Patients with fractures and articular injuries must be immobilized prior to evacuation. The most important work in this emergency is the selection of the wounded for immediate evacuation.

The surgical staff of the army should be responsible for the evacuation and transportation of the wounded. This applies to their evacuation both by automobile and railroad. At the present time in the French Army the Medical Staff is not responsible and has no authority for the transportation of the wounded from the front.

The author summarizes briefly the essential points in the surgical treatment of war wounds in different parts of the body.

W. A. BRENNAN.

### HOSPITALS; MEDICAL EDUCATION AND HISTORY

**Berry, R. J. A.: The Teaching and Study of Human Anatomy.** *Brit. M. J.*, 1921, i, 75.

Human anatomy is a study of the living in which the dead are utilized to establish the essential foundations on which the practice of medicine is based.

Anatomy has too long been regarded as a study of the dead, overburdened with a multiplicity of de-



tails and too much divorced from clinical medicine. For these reasons the passing of examinations by students is accomplished by feats of memory and, as a result, the facts are soon forgotten and no useful purpose in the study of disease is subserved. The student is unable to distinguish between the vital and the useless and in his eyes the relation of trivial arteries and the details of muscle attachments to bone are matters to be learned as thoroughly as facts regarding great veins, epiphyses, and lymphatics.

The author cites examples of how the interest of the student may be aroused by showing him the manner in which structures are modified to meet functional demands and how disease of certain parts must cause certain symptoms because of certain definite relations.

Human anatomy is now suffering from a nomenclature that is out of date and requires prompt revision. Much time is being wasted in squabbling over the nomenclature to be adopted. An accurate scientific and biological nomenclature is needed, which, within limits, shall be equally applicable to embryology and morphology. The Basle International Commission eliminated nearly 25,000 useless synonyms from the long list of names of gross anatomy, but even today its work is out of date. Anatomical nomenclature concerns the entire profession; hence all branches should be represented when a new terminology is formed.

Heredity, morphology, and physical anthropology offer unrestricted fields for research to the anatomist. The human cadaver offers few such fields. If anatomy is to be studied in the living, drastic and revolutionary changes must of course be made in the way it is taught. The anatomical laboratories should be intimately associated with the hospitals. The study of anatomy should be spread over all the curriculum and linked with medicine, surgery, obstetrics, neurology, etc.

C. F. ANDREWS.

#### LEGAL MEDICINE

##### Not a "Surgeon" and Not a "Surgical Operation."

*Maupin vs. Southern Surety Company (Mo.)*, 220 S.W.R., p. 20.

This was a suit on an accident insurance policy. One of the provisions of the policy was that the company would be liable if a legally qualified physician, surgeon, or dentist, while performing a surgical operation or autopsy, cut or wounded himself and by reason of such cutting or wounding and simultaneously therewith was infected.

The deceased was a duly licensed veterinarian, and while vaccinating some hogs accidentally cut his finger. The resulting infection caused his death. It was contended that the deceased was a surgeon

and that he was injured in performing a surgical operation. The court held, however, that from the context of the policy as well as from the definition of the terms, the veterinarian was not a surgeon. The court defined a surgeon to be one possessed of such knowledge of the human body and such skill in the use of instruments that he may be expected with reason to correct or relieve some unnatural condition of the human body. J. A. CASTAGNINO.

##### Of What Negligence May Consist—Treatment of Hernia. *Stenkowiczki vs. Lytle (Wis.)*, 177 N.W.R., p. 849.

The plaintiff in this case was affected with a hernia. Damages at \$1,350 were awarded. The physician treated the hernia by the injection method. The injection of a fluid into the tissues in or adjacent to the upper inguinal ring sets up inflammation which may close the ring with adhesions and thus prevent further herniation.

Several physicians testified that this treatment was obsolete and that the plaintiff's injuries were due to it. Others testified that the method is a recognized procedure, but not much employed at present. By reason of the conflict in the evidence the question of negligence rested with the jury. The plaintiff's physician was found to be negligent and the verdict of the jury was sustained.

J. A. CASTAGNINO.

##### Position of One Not Calling Physician as Witness. *Bernhardt vs. City & S. Ry. Co. (D. C.)*, 263 Fed. R., p. 1009.

One of the plaintiffs in this case offered to show that a physician who had attended him refused to make a further examination for the purpose of testifying for him. This was rejected. He could have shown why the doctor did not testify, but he would not be able to testify that the doctor refused to appear in court since by the service of a subpoena his attendance could have been compelled. The plaintiff had his choice; he could either call the physician or suffer the effects of the presumption that, if called, his testimony would be adverse.

J. A. CASTAGNINO.

##### Injury to Eye by Being Struck by Insect Accidental. *Tracey vs. Standard Acc. Ins. Co., Maine Supreme Judicial Court*, 109 Atl., p. 490.

The plaintiff, while riding a motorcycle, ran into a swarm of insects, one of which struck his right eye with considerable force. The condition of the eye grew gradually worse until at last the plaintiff was able to distinguish only light from darkness. He then sued to recover under an accident insurance policy. The court held that this injury was accidental.

J. A. CASTAGNINO.



## GYNECOLOGY

### UTERUS

**Fothergill, W. E.: An Address on the Use and Misuse of the Curette.** *Lancet*. 1921, cc, 59.

The author reviews the recent literature defining the misuses of the curette and states what he considers are the indications for and against its use.

Polak writes: "The curette has, but two well-defined indications: first, to remove the products of conception before the eighth week and, second, to make a diagnosis in intermenstrual uterine bleeding at or after the menopause." Heineberg condemns the use of the curette for dysmenorrhœa. Lincoln received from twenty-four medical men reports of forty-three curetting disasters with eleven deaths, a mortality of 25 per cent. He concludes: "A curettage is a major operation not to be undertaken except under the very best conditions, and with every possible precaution, by a skilful surgeon." Bovée writes: "It is a notorious fact that the most slovenly and ignorant physician resorts without hesitation to the curette for various diseases of the uterus, real or otherwise." Bovée condemns the routine curettage incident to pelvic plastic surgery and commonly used in so-called endometritis. Incomplete abortion is considered a discredited indication, the curette being "not only very hazardous but decidedly unnecessary except in case of very dangerous hæmorrhage." Subsequent involution as an indication is also discarded.

Fothergill believes that the condemnation of the curette has become too broad. The results are excellent in acute septic endometritis, whether postpartum or postabortion, if the large curette is used before the pathogenic organisms have entered the blood stream. The uterus should be swabbed, not douched, with a concentrated antiseptic, and no further intra-uterine manipulation should be resorted to. If the patient already has septiciæmia the curette does no harm, although it may do no good. In incomplete abortion the removal of the products of conception is a sound and common use of the curette.

The curette should be used in the treatment of metrorrhagia, but not in menorrhagia. Preliminary to a plastic operation curettement should be done to prevent the oversight of pathologic conditions in the uterus. Leucorrhœa is a contra-indication as is also sterility unless there is no definite cause for the condition in the patient or her husband. When both the husband and wife are young and have been married three or four years without offspring curetting leads to conception in a certain percentage of cases.

In dysmenorrhœa it is worth while to dilate if the patient has both the spasmodic and congestive type,

although the curette will not help the dull aching pain during or between periods. If the depth of the cavity is measured with a large dilator the danger of perforation is largely avoided. W. N. ROWLEY.

**Kelly, H. A., and Fricke, R. E.: The Use of Pessaries.** *Therap. Gaz.*, 1921, xlv, 5.

Kelly and Fricke review the history of the pessary. Though pessaries are no longer used in the routine treatment of gynecological lesions, they are still employed in the treatment of retroflexions of the uterus with descensus and certain cases of prolapsus. They are of no value, however, in cases of ante-flexion. The important factor is not flexion but descensus, and the answer to the vital question as to whether or not a pessary will benefit the condition depends on the findings of an examination to determine whether or not a decided descensus is present. This is best revealed when the patient is examined in the standing position. The best form of pessary is usually the simple ring made of thick rubber but in certain cases a perforated hard rubber disc is better. Next to the simple ring the authors as a rule prefer the old Hodge pessary.

When the anterior wall of the vagina pouts out neither the ring nor the Hodge pessary will prove satisfactory. In such cases the Gehrung pessary may be of value.

When there is well-defined prolapsus of the uterus with eversion of the anterior and posterior walls and the cervix is at or near the orifice any one of several pessaries may be used if there is a sufficient vaginal outlet to support the instrument. A simple light glass ball forms an excellent support.

The use of pessaries is associated with great danger as the patient may be infected with syphilis or gonorrhœa by a contaminated, unsterilized pessary. Before use the pessary should be well washed with soap and hot water and then kept in absolute alcohol for some hours. It is a most reprehensible practice to remove a pessary from a patient and simply rinse it before putting it away. Soft rubber and air inflated pessaries should be discarded as they provoke irritating secretions.

The patient wearing a pessary should take a daily douche of a pint of hot water in which a tablespoonful of salt has been dissolved. It is not necessary to remove the pessary during menstruation but it should be taken out once every three or four months and left out for several days.

The pessary is often used as a temporary expedient pending operation or to determine whether an operation giving support to the uterus will relieve the symptoms. It is of benefit also in the cases of old women for whom an operation would be too hazardous.

MARGARET I. MALONEY.



**Cole, P. P.; Inoperable Uterine Carcinoma Treated by the Cold Cautery Method of Percy; A Series of Forty-Three Cases.** *Lancet*, 1921, cc, 163.

The technique of Percy's operation is fully described, the abdominal part and the vaginal part being discussed separately. To overcome the danger of secondary hæmorrhage both internal iliac arteries, the ovarian vessels, and the round ligament were tied.

In all instances where extensive adhesions bind the pelvis they must be separated thoroughly. In many instances the tubes and ovaries are bound down at the back of the uterus to the peritoneum covering the pelvic floor, to the pelvic colon, or to the mesocolon itself and should be removed. Ligation of the iliacs would be difficult in the presence of extensive adhesions. The danger to the ureters is practically negligible, for these structures, lying as they do immediately in front of the iliac vessels, must inevitably be exposed before the vessels can be reached.

When adhesions of the omentum to the abdominal wall and pelvic viscera and dense matting of the viscera themselves are so extensive as to preclude the definition of the pelvic cavity, operation must necessarily be abandoned. It is not justifiable to proceed with the cauterization through the vagina without control exercised within the abdomen.

The vaginal portion of the operation may be complicated by inability to define the cervical canal. In such cases passage must be forced by the cautery at a relatively high heat and guided by the assistant's hand in the abdomen.

The close relationship of the bladder must be constantly borne in mind because of the possibility of causing a vesicovaginal fistula. No instance of ureterovaginal fistula occurred in the series of cases reviewed. Secondary hæmorrhage occurred once and was due to the separation of a large slough. This was not repeated, however, and the patient made an uninterrupted recovery. The use of the curette in removing redundant growth is advocated as it saves considerable time.

Two grades of heat are employed, a high grade which destroys and a lower grade which cooks. The destructive heat is employed in forcing the passage of the cervix and destroying superficial growth, the burnt tissue being readily removed.

The type of case subjected to operation was, from the radical point of view, inoperable. The rarity of demonstrable glandular invasion was remarkable. In a series of 915 postmortem examinations Leitsch, as quoted by the author, found glandular invasion in 351 (38 per cent). Metastasis occurred in 405 (45 per cent); in other words, 55 per cent of the patients who are not operated upon, die as the result of the effects of what remains to the last a local lesion. These figures were confirmed by the notes on a series of 100 postmortem examinations undertaken at the Cancer Hospital. Dilated ureters on one or both sides were commonly observed.

No selection was exercised in the choice of cases insofar as the local lesion was concerned. Attention was directed to the general condition only, no case being dealt with unless this was sufficiently good to render reasonable the immediate risk incurred. Vesicovaginal fistulae resulted in 7 cases.

The best estimation of results will be obtained from the following summary: patients died in hospital, 8 (average  $3\frac{1}{2}$  months); patients re-admitted, died in hospital, 4 (average  $2\frac{1}{2}$  years); patients discharged, died outside hospital, 17 (average 1 year, 4 months). Several cases are discussed separately as to the cause of death.

The penetrating power of the low heat advocated by Percy and the alleged vulnerability of cancer cells to a degree of heat insufficient to destroy the vitality of normal tissue cells are questions which existing data do not answer. It must be remembered that in the cases reviewed the patients' condition could have been made worse with difficulty and that any relief obtained was so much gained. Bearing these facts in mind, this operation, particularly when re-inforced by subsequent radium treatment, should have a place in the armamentarium of the surgeon. When it is used discreetly and discriminately, a great deal may be done to alleviate the distressing disabilities of uterine cancer.

J. E. STRUTHERS.

**Deaver, J. B.: Hysterectomy in the Lankenau (Formerly the German) Hospital.** *Ann. Surg.*, 1921, lxxiii, 84.

Deaver's article consists of a report of 130 hysterectomies performed at the Lankenau Hospital during the year 1919. Forty-six of these were complete, and 84, subtotal hysterectomies. Two deaths occurred in the series, giving a mortality of 1.5 per cent. One death was due to myocarditis, and 1 to vesicovaginal fistula due to radium treatment.

The operation was done 5 times for carcinoma of the uterus and in 2 instances for prolapse of the uterus complicated by inflammation of other pelvic structures. In all the other cases it was performed for some form of fibroid. The author concludes that total hysterectomy is the better operation in this type of case, particularly when the patient is near, at, or past the menopause and especially when there is any question regarding the condition of the cervix or the endometrium. The author's subtotal hysterectomy is performed by making a wedge-shaped amputation of the cervix and implanting the stump of the broad ligaments into the cavity so formed.

Complete removal of the uterus is accomplished by removing the upper part of the vagina and the cervix with the cautery above a right-angled clamp. The stumps of the broad ligaments are fixed to the vaginal cuff and the entire area covered by the reflected peritoneum of the bladder which is carried back to the posterior wall of the vagina.

In cases of large, soft myomata of the uterus causing enlargement resembling that due to pregnancy,



the author has no hesitancy in making an incision into the anterior wall of the uterus to confirm the diagnosis.

Deaver's confidence in transperitoneal hysterotomy is so great that he opens the uterus readily to make a diagnosis of intra-uterine conditions and removes submucous fibroids of the uterus by this operation. When by reason of the size or position of the fibroid the operation is particularly difficult, he removes the fundus of the uterus first and completes the total hysterectomy by removing the cervix separately.

The greatest risk in performing complete hysterectomies is the risk of injuring the ureters. Deaver tries to avoid this by exposing the ureters. When, however, such an error is manifested after operation, it should be recognized promptly and corrected at once.

Myomectomy is a very satisfactory operation for subserous pedunculated fibroids, but the submucous type is best attacked by the transperitoneal route. For other types, especially in anemic patients, the author prefers complete hysterectomy, believing it to be less serious than myomectomy because of the smaller blood loss.

During the same year in which the 130 hysterectomies were performed 58 cases were treated with radium, 39 for carcinoma of the cervix, 12 for carcinoma of the uterus, 5 for myoma uteri, and 2 for chronic endometritis. One death occurred in this series. While the author admits that figures alone are not convincing, he states that in this instance they speak in favor of surgery. Such emphatic claims have been made for radium that Deaver believes opposing voices should now be heard.

In the decision for or against radium the opinion of the surgeon should be accorded equal weight with that of the radiologist.

While admitting that the use of radium will control uterine hæmorrhage and reduce the size of fibroid tumors, the author wonders whether a woman can well carry a uterus which has been "burned to death." He states that 4 deaths following the use of radium have been called to his attention. It is his practice to do a transperitoneal removal of the uterus in cases of fundal carcinoma or malignancy of the cervix found in the early stages. In his judgment radium should be used only in the late stages when the malignancy has extended beyond the reach of the knife. In such cases radium undoubtedly prolongs life but it is doubtful whether it ever produces a cure.

Even cases of non-malignant uterus with free hæmorrhage must be selected most judiciously. The author registers an emphatic protest against the use of radium in the treatment of young women. Radium has been most disappointing to him in the treatment of purulent leucorrhœa, and operation other than complete removal of the uterus has also failed to be efficacious. Considerable attention has been given to myopathic hæmorrhage, and ex-

tensive pathologic and histologic investigation has been undertaken. The theory attributing this condition to ovarian dysfunction is far more difficult to prove than the others. Deaver is inclined to agree with Anspach who found certain sclerotic changes in the uterus following childbirth. Failure of the elastic tissue in the uterus to functionate might easily lead to otherwise unexplainable bleeding.

In a study of the action of radium on tissues it was found that the normal tissue of the organ is destroyed to a considerable extent and replaced by connective tissue. One specimen studied was obtained from a case in which radium had been applied to a carcinoma of the cervix. Extensive necrosis was found in the tissues near the site at which the radium was applied and ulceration extended throughout the uterus. The entire wall of the uterus was involved in a violent inflammatory reaction which spread also to the adnexal organs.

There is no doubt in the author's mind regarding the intensely destructive action of radium. If the dose could be graduated to destroy endometrium alone, when this is desirable, its field of usefulness would of course be established. When, however, its destructive properties are not controllable, its power for harm is limitless.

W. H. CARY.

#### EXTERNAL GENITALIA

**Imbert, L.: Strip Perineoplasty for Complete Perineal Rupture** (Perineoplastie à lambeau pour déchirure complète du périnée). *Gynéc. et obst.*, 1920, ii, 364.

In the ordinary methods of repairing complete perineal rupture the anorectal and vulvovaginal mucosa is sutured and the intervening space is covered by joining the two cutaneous borders. This suturing often yields. To prevent this mishap the author uses a pedunculated strip from the buttock. The strip is cut about 1 cm. thick and includes cellular tissue. Its two edges are sutured to the edges of the two primary transverse incisions made to facilitate the suturing of the mucosa.

There is thus interposed between the vagina and anus a thick, well-nourished wedge of tissue which has no tendency to become necrotic and by its volume easily keeps the two channels apart. The whole operation is done at one time. The author has had a successful permanent result in three cases in which he used this procedure. W. A. BRENNAN.

**Hoerrmann, A.: The Formation of a Vagina from the Small Bowel in a Case of Complete Absence of the Vagina** (Ueber den Ersatz der Vagina aus Duennndarm bei vollkommenem Defekt derselben; uterus bicornis unicollis rudimentarius). *Muenchen. med. Wchnschr.*, 1920, lxvii, 1203.

The patient was a woman 25 years old who had well-developed secondary sexual characteristics, tubes, and ovaries. The author formed a new vagina from the small bowel according to the method of Haeberlin-Mori which he somewhat modified. In



the after-treatment the tendency toward contraction was overcome by speculum dilatation. The patient later married and coitus is possible without pain.

Other authors also have stated that the vaginal plastic operation of bowel implantation gives excellent results with regard to coitus. To justify resection of the intestine, which even today is not without risk, the danger to life must be reduced to the minimum. Therefore in order to assure perfect asepsis of the resected portion of intestine it is important to close each end tightly with a purse-string suture and, instead of bringing the intestine down by means of a forceps inserted in the vagina, to draw it through the peritoneum preferably by means of an Amann sound passed into the previously prepared vagina in the first step of the operation.

The choice of the small intestine for the operation is based on the fact that the rectal ampulla is not always of sufficient size to permit the resection of a large portion and in general the transplantation of the large intestine has certain anatomical contraindications.

H. V. WAGNER (Z).

**Strong, L. W.:** Vaginal Cysts. *Am. J. Obst. & Gynec.*, 1921, 1, 357.

Traumatism or operative enclosure may result in a cyst without characteristic features. Heterotopic vestibular or cervical glands may give rise to cysts of the vagina. Vaginal cysts may have their origin also in columnar epithelium which, as the result of faulty development, has taken the place of the squamosa of the vagina. Such cysts are apt to be small and multiple.

The walls of a vaginal cyst may contain muscle fibers, but these may be derived from the vaginal musculature and are not peculiar to cysts of Gaertner's duct. Vaginal cysts occur rather more frequently on the lateral and anterior walls than on the posterior wall. The areas most often involved are the epöphoron, the ampulla, and the lowest portion of the vagina, including the hymen. Abnormalities in the form and course of the duct occur. The epithelium is normally so variable and individual that it is difficult to distinguish true abnormalities; squamous epithelium has been found in adults. Cysts are the most common variation from the persistent Gaertner's duct and occur in various sites.

The author describes two cases illustrating two types of vaginal cysts, the large, probably of wolffian origin, and the small, probably due to heterotopia of the vaginal squamosa. The first case had been diagnosed as cystocele. Upon examination a thin-walled cyst the size of an orange was found in the lower anterior vaginal wall. This was easily removed and the patient made an uninterrupted recovery. The cyst had a diameter of approximately 8 cm. The inner surface was smooth but the outer surface had been roughened by hæmorrhage. Several sections showed dense connective tissue without signs of epithelium, and others, a single-layered, high columnar, non-ciliated epithelium thrown into marked papillations.

In the second case, regarding which the author had no data except the findings in the slides sent for microscopic examination, the cyst was on the anterior vaginal wall just lateral to the cervix. Microscopic examination showed that the squamosa was interrupted abruptly by columnar epithelium which in places showed definite papillations. Beneath the surface were occasional glands with simple tubular outline. The wall consisted of muscle and connective tissue with no characteristic arrangement. Without further information regarding the size of the cyst it was impossible to state its origin, but its location strongly suggested that it arose from Gaertner's duct. The other possibility, that heterotopia of the squamosa was responsible, was suggested by the fact that there were alterations of two forms of epithelium.

MARGARET I. MALONEY.

### MISCELLANEOUS

**Burke, J.:** Exstrophy of the Bladder in the Female. *Ann. Surg.*, 1921, lxxiii, 100.

Burke reports the case of a girl, 16 years of age, with classical exstrophy of the bladder. The patient was prepared by the administration of 1½ oz. of castor oil two days before and a steam bath the day before operation. On the morning of the operation at 4 and 6 o'clock a soap and water enema was given. The abdomen was prepared as for laparotomy. A hypodermic injection of ¼ gr. morphine sulphate and 1/150 gr. atropine sulphate was given a half hour before the operation. Anæsthesia was induced with ether. The abdomen and bladder were thoroughly iodized with 5 per cent tincture of iodine.

Ureteral catheters having been introduced in the ureters for 6 in. to serve as guides to the position and course of the ureters and to divert the urine from the field of operation, a 2½ in. incision was made in the median line to the mucocutaneous juncture and down to the rectus fascia. The fascia was then divided. Preperitoneal fat presented but the muscle was very deficient. Beginning at the posterior wall of the bladder at the lower end of the incision, the peritoneum was separated from the bladder with gauze on the index finger with surprising ease. As the separation progressed the bladder was severed from the skin at the mucocutaneous juncture with curved scissors around its entire circumference. The separation with the gauze-covered finger was then continued down to the ureters which were easily distinguished because of the inserted catheters. After the ureters had been stripped up 1½ in. the bladder was divided vertically.

All the bladder was then removed except a button or rosette ½ in. in diameter containing the ureteral meatus in the center. Thus the blood supply of the ureters as well as their sphincteric action was preserved. Two mattress sutures of catgut were then introduced into each rosette, the ends being left long. At this stage an assistant inserted his



index finger into the vagina and his middle finger into the rectum. The index finger marked out the vagina plainly. A long forceps was then inserted into the rectum alongside of the finger and the tip pressed against the anterolateral side. The tip was easily felt by the operator as only the rectal wall and pelvic fascia intervened.

A small incision was made over the tip of the forceps and the long ends of the catgut attached to the rosette were pushed through. The catgut was then pulled upon and the rosette and ureter were drawn through so that about  $\frac{3}{4}$  in. of the ureter hung in the rectum about 1 in. above the anus. There was no kinking or torsion of the ureter; only its direction was reversed.

The same technique was used for the ureter on the other side of the rectum. The remainder of the bladder was extirpated and iodoform gauze packed loosely down on either side of the vagina to the rectum to stop the oozing, which was considerable, and to prevent the ureters from slipping out of the rectum. The abdominal wound was closed almost to the pubes, the gauze strips being left hanging out. The catgut strands attached to the rosettes were drawn outside the anus and held taut by adhesive plaster to keep the ureters from pulling out of the rectum, and a rubber tube was inserted in the rectum.

After the operation water was given copiously, 5 gr. of urotropine every four hours, and morphine when necessary for pain and restlessness. The day following the operation the dressings were saturated with blood, but there was no urinary leakage. Urine passed per rectum immediately after the patient was returned to bed. On the fourth day the gauze strips and tube were removed. The temperature and pulse remained up (102 degrees F., and 120) until about the ninth day when they became and remained normal. During the first two weeks the patient used the bedpan every hour and there was fair sphincter control. After this, she was out of bed and the demands became gradually less until she was able to go all day without a bowel movement and sleep the night through.

Clinically there are no signs of pyelitis. Six months after the operation the patient has no distress whatever.

The author believes this to be the first case in which this technique was employed successfully in the female.

C. W. BETHUNE.

**Hobbs, R.: The Treatment of Gonorrhœa in Women.** *Practitioner*, 1921, cvi, 31.

The treatment of gonorrhœa in women is still in the experimental stage and lacking in efficiency, particularly when the disease complicates pregnancy as the latter condition precludes the application of certain methods, otherwise desirable, because of the fact that the endometrium is affected.

The reasons for the lack of success in the treatment of gonorrhœa are that the disease is characterized by infection of the deeper tissues of organs

which are difficult to drain, and cure is obtained only when the last micro-organism has been removed. In the author's opinion the main cause of the chronicity of gonorrhœa in women is infection of the endometrium.

In the early stages the use of a preparation of glycerin and tincture of iodine is recommended. The author begins with 1 dr. of tincture of iodine to an ounce of glycerin. This strength is soon increased until equal parts of iodine and glycerin are used. The cervix is swabbed out with the preparation as soon as the parts become less painful and it is possible to pass a speculum. The urethra is also swabbed out with the same solution. This is done every five to seven days. The daily treatment consists of swabbing the vagina and vulva with ether soap and water (1 dr. to the pint), and then with saline (1 dr. to the pint). The vagina is then thoroughly dried with swabs on holders. The bladder is irrigated with permanganate of potash 1:5,000.

The length of time required for the treatment is from two to three months. As soon as the vaginal walls have become paler and less œdematous and the secretion has assumed a white, curdy texture, the swabbings are made at longer intervals and drugs which are more astringent in character, such as  $\frac{1}{2}$  per cent picric acid, and the various silver solutions, may be used if necessary.

When the cervical catarrh persists and the smear remains positive, the treatment is as follows:

A small tampon of gauze, about 3 in. long, is constructed and to it are attached a few strands of thread. This tampon is saturated in a solution consisting of iodine 3 parts and glycerin 1 part, and introduced into the cervical canal through a Ferguson speculum with a Playfair probe. The tampon is left *in situ* for six hours and then withdrawn by means of the threads. This method produces a more intense reaction than ordinary swabbing, and it is often possible to demonstrate the next day a positive smear from the cervical canal. Smears should be taken from the cervix, the urethra, and the vagina at regular intervals of about three weeks until they become negative.

With regard to gonorrhœa complicating pregnancy it is generally held that treatment of the cervix is contra-indicated by the risk of miscarriage unless the circumstances are very exceptional. There is no doubt that under improper or unsuitable treatment this risk is a real one, but the author believes there is greater risk of miscarriage from the infection of the endometrium than from properly applied treatment to the cervix.

In this type of case the treatment outlined is carried out, and in addition a small tampon saturated with equal parts of iodine and glycerin is introduced into the cervical canal and left for one hour. This is repeated every fourteen days until the cervical secretion appears normal and the smears are negative. The treatment has been carried out as late as the eighth month of pregnancy.



During labor treatment can consist only in the use, as far as possible, of prophylactic measures against ophthalmia neonatorum. When the vaginal secretion is abnormal, the vagina is thoroughly swabbed out with ether soap and water and saline solution, and the urethra, vagina, and cervix are swabbed with equal parts of iodine and glycerin.

M. I. MALONEY.

**Bullard, E. A.: Gynecological Backache.** *N. York M. J.*, 1921, cxiii, 142.

Certain surprising observations made in the postoperative follow-up clinic at the Woman's Hospital, New York, during the past few years led Bullard to make an analytical study of backache. In a series of 721 cases of this malady 85 per cent were cured by an appropriate operation. Bullard divides the cases into nine groups and shows that there were a number of cases in each in which the operative results were anatomically excellent, but the backache was unrelieved.

Group 1 included 129 cases of retroversion of the uterus uncomplicated by any other gynecological abnormality. In this series the backache might easily have been due to the displacement, but the end-results proved that in 20 per cent neither this nor any other gynecological condition was responsible.

In Group 2 were 68 cases of retroversion of the uterus with adnexal inflammation. Elimination of the pressure of an adherent uterus or a tubo-ovarian mass, or relief of the drag of adhesions seemed to effect a cure in 87 per cent. In 13 per cent the backache was probably not due to a pelvic condition but its cause was not ascertained.

In Group 3 were 19 cases of adnexal inflammation. The results of operation seemed to justify the opinion that salpingitis with adhesions may produce backache as all but 2 of this group were cured by ablation of the inflamed tubes or of both the tubes and ovaries and the release of adhesions.

Group 4 included 84 cases of uterine prolapse of various degrees. Eighty-nine per cent were relieved by operation, the backaches probably having been due to the drag on the pelvic supports. In the cases unrelieved the operation was anatomically satisfactory and no pelvic lesions were found which would explain the continued pain.

In Group 5 were 46 cases in which only a plastic operation was performed for some condition such as a cystic, eroded, lacerated, or hypertrophied cervix or chronic endocervicitis. The backache was cured in every case. This group, however, is too small to warrant conclusions.

In Group 6, which comprised 23 cases of uncomplicated retroversion of the uterus with lacerations of the perineum or cervix, operation resulted in a cure in every instance.

Group 7 included 7 cases of uncomplicated ovarian cyst. The backache was cured by operation in 5 cases and unrelieved in 2.

In 38 cases of fibromyomata which made up Group 8 the backache was cured in 33 cases by hysterectomy and unrelieved in 5 cases.

Group 9 included 307 cases in each of which two or more conditions were present and one of the conditions was capable of causing backache. Of this series, 260 cases were cured by operation. The remaining 47 were unrelieved.

Bullard is of the opinion that probably much more than 15 per cent of the cases of backache in women are not gynecological as in his series presenting one or more common gynecological causes of backache that percentage was not relieved by anatomically satisfactory operations, and from 15 to 20 per cent of all women with retroversion or prolapse of the uterus, pelvic inflammations, obstetrical lacerations, or pelvic tumors do not have backache. Closer co-operation with the orthopedist, the internist, and the neurologist should enable the gynecologist to diagnose and treat backache in women more efficiently.

MARGARET I. MALONEY.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

Schulze, A. G.: *The Value and Significance of the Blood Pressure in Obstetrics.* *Minnesota Med.*, 1920, iii, 585.

In a series of 50 consecutive private patients the author made the following blood-pressure determinations:

Number of Readings	Month of Pregnancy	Average Blood Pressure Mm. Hg.
12	4	109.5
18	5	110
21	6	111.5
18	6.5	113
21	7	112.6
26	7.5	114.6
34	8	114.6
36	8.5	117.3
24	9	119.5

The average of 210 readings made for 50 pregnant patients from the fourth month to full term was 117.25, and the rise from the fourth to the ninth months was exactly 10 mm. Hg.

In the series of 145 consecutive cases at the City Hospital Schulze found the average of 75 blood pressure readings taken when the patient was at full term but not in labor was 123.5; the average of 86 readings taken as near as possible to the second stage of labor was 133; and the average of 104 readings taken three hours after the completion of labor was 120 mm.

The author summarizes the results of his investigations as follows:

1. A series of blood-pressure readings properly taken serves as an index of the eclamptic or the non-eclamptic condition of the patient.

2. The normal range of blood pressure during pregnancy has been found to be between 100 and 130 mm. Hg., with 114 to 118 as an average.

3. If the blood pressure is below 100 mm. Hg. be prepared for shock. If it is above 150, it is no longer to be regarded as normal.

4. A moderately high blood pressure which shows no tendency to mount and is not accompanied by symptoms of eclampsia is not necessarily serious. A low pressure unaccompanied by symptoms of eclampsia is not necessarily serious. A low pressure unaccompanied by symptoms of eclampsia which does show a tendency to mount should be regarded with suspicion.

5. A gradual rise in blood pressure takes place throughout pregnancy, not merely in the last months and during labor. After delivery a return to the low level takes place.

E. L. CORNELL.

## LABOR AND ITS COMPLICATIONS

Pfeiffer, W.: *The Management of Breech Presentation.* *N. York M. J.*, 1921, cxiii, 177.

Pfeiffer believes that a study of the management of breech presentation which neglects the etiology is incomplete as the etiology will indicate whether the condition may be corrected or not. With the exception of deformed pelvis, such causes are those which interfere with adaptation by changing the shape of either the uterine cavity (hydramnios; multiparity, especially rapidly succeeding pregnancies; twins; and fibroids) or the shape of the foetal ovoid (prematurity, twins, monsters).

The obstetrician should not be tempted to apply traction on the buttocks as soon as they bulge the pelvic floor as a large percentage of breech cases will deliver themselves to the umbilicus; a smaller but not inconsiderable percentage will deliver to the shoulders; and not infrequently the aftercoming head will be delivered spontaneously. Thus there is a normal mechanism for this presentation and our attitude should be one of prepared expectancy.

The author therefore feels that in view of the fact that the foetal mortality of breech deliveries is 10 per cent, anything which can be done to reduce this to the 1 per cent of the cephalic presentation is warranted. He attempts to do this by external version at the onset of labor with the patient in the Trendelenburg position and the use of anaesthesia if necessary. He turns always so as to keep the foetus flexed. Lateral pads and an abdominal binder may be needed to maintain this new presentation.

The membranes usually rupture at the onset of labor because the irregular breech does not fill the lower uterine segment as well as the globular head. Thus the first stage is prolonged because the firm equal pressure of the hydrostatic dilator is lacking, and in its place is the soft, compressible breech.

The uncomplicated breech presentation should be left alone until a definite indication for interference arises on the part of either the mother or the child. It is well to keep the patient in bed in order to preserve the membranes if they are intact and to prevent prolapse of the cord if they are ruptured. This must be a period of watchful waiting during which a competent assistant must be within call, the instruments, including forceps, should be sterilized, the patient and materials prepared for an operative delivery, and aids for resuscitation made available. The bladder and rectum must be emptied.

The second stage is usually shorter. As the buttocks strike the pelvic floor the soft parts should be widely dilated or a central episiotomy should be done. The advisability of using an anaesthetic



depends on how well the patient can be controlled. If her efforts do not advance the breech an assistant should begin compression on the fundus. From the time the umbilicus appears the delivery must be completed in from eight to twenty minutes.

If the arms are extended they are drawn down by an assistant who passes his hands down the abdomen. The head must be kept in flexion. To deliver the posterior arm the fœtus should be seized by the heels, knees, or pelvis, and the body drawn down in the axis of the inlet until the posterior shoulder is within reach. The body should then be sharply flexed until it lies in contact with the mother's abdomen. It then may be delivered by two fingers.

To rotate the body to bring the undelivered arm posterior, the obstetrician's thumb should be placed on the scapula of the delivered arm with the fingers on the chest wall, and with the child's feet in his unoccupied hand the trunk should be rotated 180 degrees. The head should next be brought into one of the occiput anterior obliques and flexion maintained by keeping a finger in the mouth. The head may then be expressed by pressure from above.

Pfeiffer's conclusions are:

1. Breech presentation may be corrected more often than is commonly supposed and external version should be attempted unless the cause of the condition makes this impossible.

2. There is a definite mechanism for buttock, shoulder, and head presentations, in all of which spontaneous delivery often results. Hence, unless there are positive indications in either the mother or the child, interference is not only meddlesome, but dangerous as it may render a simple case difficult and seriously endanger the life of the child.

3. Of importance in the management of spontaneous delivery of a child presenting by the breech are a fully dilated os and a well-stretched floor. In breech extractions this is particularly necessary.

4. An able assistant is of importance in all cases as expression is better than traction.

5. Cæsarean section may be necessary occasionally, but this operation is indicated by associated anomalies rather than by the breech presentation

EUGENE CAREY.

#### NEW-BORN

**Brisset, A.: A Rapid Method of Making a Solid Ligature on Large Gelatinous Umbilical Cords**  
(Un procédé rapide pour faire une ligature solide sur les gros cordons gélatineux). *Rev. franç. de gynéc. et d'obst.*, 1920, xv, 421.

Four or six strands of thread 25 to 30 cm. long are tied together in the middle by a simple knot. One end of the resulting cord is divided into two parts of two or three strands. The umbilical cord at about 2 cm. from the umbilicus is then placed between the two parts and the two parts are tied down upon it tightly to crush the cord as well as the vessels. The cord is then sectioned about 1 cm. above the ligature. Both ends of the threads, that on the right and that of the left side, are then carried above the section and tied by a surgical knot which is strongly tightened to close the pedicle transversely.

By this method the umbilical vessels are strongly compressed and the portion of umbilical cord above the ligature is enlarged into a collar which prevents slipping.

W. A. BRENNAN.



# GENITO-URINARY SURGERY

## ADRENAL, KIDNEY, AND URETER

**Castellanos, I.:** A New Method of Exploring the Kidney (Nuevo método para la exploración del riñón) *Rev. méd. de Sevilla*, 1920, lxxiv, 329.

For many years the author has employed a special method of renal percussion in his hospital practice in Peru and also in the New York Post-graduate Hospital. It may be described briefly as follows:

With the patient in ventral decubitus, the palm of the extended left hand is placed upon the lumbar region with the end of the flexed middle finger in the vertex of the costovertebral angle. The flexed finger is then forcefully percussed with the outer edge of the right hand.

This procedure is regarded as the application to the kidney of the "hammer stroke" percussion used by Murphy in the examination of the gall-bladder. It is thought to be more accurate, however, as the blow of the outer surface of the hand is not as forceful as that of the fist, and the area involved is smaller.

W. R. MEEKER.

**Walther, H. W. E.:** Bilateral Renal Dystopia. *Surg., Gynec. & Obst.*, 1921, xxxii, 82.

The author gives two theories as to the cause of the dystopic kidney, one based upon embryological changes and the other upon the ascent of the kidney from the wolfian body and its arrest in this process.

The dystopic kidney is usually normal in size, although in Plummer's case it was very small. As reported by Meyer, there are generally two or three arteries leading to the kidney. The kidney may be situated anywhere from entirely within the pelvis up to the normal position. In some cases it may be found near the aorta and in others the two kidneys may be fused.

Strater found the adrenals usually in their normal position, but Morris discovered them to be displaced in 9 of 20 cases. The author gives the following anatomical résumé of the necropsy findings in 18 cases: (1) kidney fixed, densely bound down, flattened; (2) renal pelvis usually situated anteriorly; (3) kidney situated about sacro-iliac synchondrosis, i.e., below the pelvic brim; (4) one small single artery with possibly as many as six branches entering at an abnormal site; (5) veins multiple, much enlarged, emerging at an angle; (6) adrenal bodies in their normal subdiaphragmatic location; (7) lobulation of the kidney; (8) hypoplasia of the calyces; and (9) ureters normal in caliber, but short.

The symptoms vary considerably. As described by most authors, they consist of pain in the lower mid-back, abdomen, loins, and buttocks, radiating at times into the lower limbs, and a feeling of weight

in the abdomen. Plummer's report is the best statement the author has seen in regard to the clinical picture.

The case reported by Walther was that of a white male, 23 years of age, who was seen in the Out-Patient Department of the Charity Hospital, New Orleans. The symptoms were frequency and burning at urination; the voiding of cloudy, shreddy urine; pains in the loins; and occasionally attacks of fever. Venereal infection was denied.

The cystoscope and a pyelogram revealed the presence of both kidneys in the pelvis. The case was observed for two weeks in the hospital, after which the patient disappeared. He was seen again, however, about a year later at which time the urine was still cloudy. In the first two hours he excreted 455 c.cm. of urine with 8 per cent of phtalein. At the time the case was first observed the bladder contained 300 c.cm. of residual urine, while at the last examination it contained 360 c.cm. A few bladder irrigations were given but the patient then again disappeared.

The author appends a very complete bibliography.  
A. C. STOKES.

**Herrick, F. C.:** Trauma as a Factor in the Etiology of Hydronephrosis (Pyelectasis). *J. Urol.*, 1921, v, 1.

The author presents a study of the causes of hydronephrosis with especial reference to trauma. In referring to cases of partial or complete dilatation of the renal pelvis Herrick prefers the term "pyelectasis" to the common term "hydronephrosis," and the use of the prefixes hydro-, hæmo-, and pyo- to designate the contents of the sac.

In a study of 48 cadavers the average mobility of the kidney within its supporting structures was found to be 4 cm. on the right side and 4.5 cm. on the left side. The portion of the ureter subject to greatest mobility is the upper 4 or 5 cm. of its course, from the point where it leaves the peritoneum to pass through the perirenal fat to the kidney pelvis. Here it is most subject to angulation and stricture.

In the author's opinion the stages in the development of the type of pyelectasis under discussion are as follows:

Periodic, partial, or complete ureteral obstruction due to renal mobility following trauma or strain; back-pressure on the renal secretion with injury to the secreting mechanism; infection causing pyelonephritis and ureteritis, and still further damaging secretion and the renal parenchyma. Ureteritis is most marked at the point of ureteral angulation and is associated with the danger of stricture formation.

The author gives the details of 9 cases.

H. L. SANFORD.



**Cabot, H.: Infections of the Kidney. J. Iowa State M. Soc., 1921, xi, 1.**

This paper contains an outline of infections of the kidney and a discussion of Cabot's method of diagnosis and treatment.

The author first brings out the point that the pathologist and clinician have been too far apart in their studies of the infections. The pathologist reports tissue changes as he finds them at death, and these are usually the lesions which cause death. Such findings do not necessarily indicate conditions as they exist during the patient's life. Reference is made to the dictum that tuberculosis of the kidney is always bilateral as found by the pathologist while the clinician usually sees it as a unilateral condition.

Cabot criticizes the theory that cystitis may be a primary infection and the assumption that infection of the kidney or the pelvis is an infection which has ascended by way of the ureter or its lymphatics. He calls attention to the fact that organisms which outside the kidney produce pus and abscesses have the same activity within the kidney, while organisms which rapidly tend to destroy tissue also do the same within the kidney.

The infectious lesions of the kidney may be classified according to the properties of the organism causing them. In the first group are the staphylococcus and the streptococcus pyogenes and various bacilli but the staphylococcus and streptococcus pyogenes are the most common. These organisms produce lesions close to the renal cortex because they stop there, not being able to pass through the kidney freely.

They produce circumscribed areas of suppuration and do not spread broadcast. They are responsible for subcortical abscesses which cause perinephritis and perinephritic abscess.

In this type of infection there are frequently no findings in the urine. The urine may be normal during the entire course of the disease, but by careful examination and thorough centrifugalization the organisms may be isolated on culture.

A severe type of this infection is that in which focal necrosis occurs and frequently the entire kidney is destroyed within a very short time. Sometimes it is very difficult to differentiate between this severe type of infection and gastric ulcer or acute appendicitis.

Cabot describes this infection as always associated with fever of a septic type. There is a definite enlargement of the kidney. It is the only type of infection in which, within a day or so, a definite and tender kidney tumor can be palpated.

For the acute cases, Cabot advises surgery, either nephrectomy or nephrostomy. He states that it is difficult to determine when a kidney should be removed and when it should be allowed to remain. In doubtful cases Cabot has had less trouble when he removed the kidney at first than when a subsequent nephrectomy became necessary.

Precisely opposed to the picture of coccus infection of the kidney just described is that due to the

group of bacilli commonly referred to as the colontyphoid group. Such infections are essentially different from the coccus infections and more complicated. They constitute the majority of the kidney infections.

Pyelitis has been attributed to this group of bacteria because of the predominance of the symptoms of pyelitis but we know that the kidney is infected primarily and the pelvis secondarily. The picture is that of a low grade of infection of the kidney producing a cloudy swelling which rapidly clears up within a few days. The organisms pass through the kidney and find a resting place in the pelvis.

The effect of the organisms upon the function of the kidneys is very striking and quite opposite to that produced by the coccus infection. The coccus infection involves chiefly the cortical area, not the secreting portion of the kidney, and does not materially lower the kidney function. The colon bacilli, however, produce a diffuse process through the secreting portion and have an immediate and very decided effect upon the kidney. Usually the functional disturbance lasts only two or three days, the function then increasing again as quickly as it decreased.

In the severe cases recovery seems to occur quickly but in those with very few symptoms a great deal of time is necessary to effect a cure. In the chronic type the author found an infiltration of the renal pelvis with organisms living in the deeper layers. This tends to produce a stiff condition of the renal pelvis which is the beginning of a vicious circle. The kidney will be destroyed eventually as a true ascending infection begins from the pelvis to the areas between the pyramids. Infection in this locality is followed by the formation of scar tissue which eventually decreases the kidney substance to about one-half.

The author believes that infection during pregnancy is very common, and because of the pressure of the enlarged uterus and poor drainage at this time, he wonders that all cases are not infected. The etiology of such infection, especially that which is so common in the first pregnancy, he is not able to explain.

The third type of infection discussed is that produced by the streptococcus which affects primarily the glomerulus. There is usually no change in the urine at any stage. The author is not sure what other organisms might produce this same infection.

In Cabot's experience there is no way of discovering acute glomerulonephritis. It is found post-mortem. Streptococci may be discovered in the urine at the height of the disease.

In the coccus group of infections surgery is indicated while in the bacillus infections operation is rarely necessary. There is a certain group of cases of cocci infection in which Cabot has found restriction of the diaphragm due probably to a very small perinephritic abscess. In such cases he has refrained from operating but insists that when a large abscess is present it should be drained at once.



For the treatment of the bacillus group of infections Cabot recommends urotropin but with this some drug such as boric acid or sodium benzoate must be given which will make the urine distinctly acid.

Cabot has had no good results from autogenous vaccine. In pregnancy, lavage and drainage of the kidney pelvis may be beneficial. G. J. THOMAS.

**Roth, L. J.: Some Observations from the Clinical and Laboratory Findings in Pyelitis and Pyelonephritis.** *California State J. M.*, 1921, xix, 16.

The author presents his observations based on a fairly large number of cases, the outcome of which varied from spontaneous recovery under very simple treatment to lethal termination in cases not operated upon and also in one case in which a nephrectomy was performed even though the prospect of benefit seemed slight.

The subjective symptoms, clinical course, and results of laboratory analyses are not at all parallel either in mild or severe cases. In a single day Roth has seen in the same case a swirling bacilluria and a perfectly clear urine.

There are two chief and absolutely distinct forms of renal disease. The first includes the medical nephritides described by Vidal as characterized by the syndromes of chloruræmie and azotæmia, and the various types of interstitial, tubular, and glomerular disease. The second form includes the familiar conditions in which the microscope reveals the presence of casts, pus, blood, and bacteria, and the presence or absence of albuminuria.

The ingrafting of bacteria and the formation of pus may occur in an already nephritic kidney and the presence of casts may be due to the cast-producing factors of the associated Bright's disease instead of the essentially pyelitic and pyelonephritic condition.

The pathology varies with the route of infection and whether or not the urinary tract was normal at the time of the infection. In descending or hæmatogenous infection, congestion is invariably present and there may be ecchymoses of the parenchyma and pelvis. In the acute forms the glomerular and tubular epithelium undergo granular and other changes, and cellular infiltration occurs. In the chronic forms, the bacteria are liberated from the blood vessels and produce lesions varying from abscess to sclerosis without suppuration.

Careful laboratory search has failed to reveal casts in a large proportion of cases, and has shown only a few hyaline casts in each of three observations. Both hyaline and granular casts were found in only one case. The presence of blood in the urine may be confusing as the consequent presence of albumin in greater or less quantity which may mask a true albuminuria and the blood itself may be of other than renal origin. This can be partially overcome by having the specimen voided.

The blood count has no distinctive diagnostic value from a numerical point of view; that is, a

leucocytosis of 10,000 is of as much significance as a count of 20,000. Therefore in no instance has it been possible to differentiate mild draining urinary infections from closed collections of pus.

The presence of pus and bacteria in the upper urinary tract is not unusual and very often is symptomless, as other factors such as retention, inflammation, and resorption may be responsible for the constitutional disturbances in such cases.

The treatment has been surgical or expectant, or has consisted of kidney drainage by means of a retention catheter and single or repeated pelvic irrigations. The use of vaccines was early abandoned. LOUIS GROSS.

**Kelly, H. A.: Operation for Renal Calculi.** *N. York M. J.*, 1921, cxiii, 1.

The best incision is through the posterior superior lumbar triangle. In many cases the author pulls the tissues widely open with his hands by blunt dissection, thus securing sufficient room to introduce four or five fingers or the whole hand. After breaking through Gerota's capsule by simple traction with the forceps on the perirenal fat it is often possible to draw the entire kidney out onto the surface. Whether it comes out in this way, or whether it is necessary to detach it by gentle manipulation on all sides, separating it particularly in its upper pole, it is displaced in most cases, onto the loin without the slightest damage, and dealt with there in the succeeding stage of the operation. Often, however, knowing the exact position of the stone, Kelly operates upon the kidney *in situ*, making a direct opening into its lower pole, or simply frees and tilts down the upper pole so as to bring it within reach for the extraction of the calculus.

In either case, whether the kidney is treated *in situ* or outside, it is gently palpated between the thumb and fingers, including the renal pelvis, to locate the stone. If the stone is found it can be thrust up toward the dorsum with the fingers to facilitate its enucleation. If it is not so located, then with the X-ray placed before him as a guide, the author's next step is to take a fine needle about 6 cm. long, fastened in a cork, and thrust this into the kidney where the stone is believed to be. Once the needle touches the stone, it is left *in situ*, while a small incision (averaging about 2 cm. in length, but varying with the size of the stone) is made through the renal capsule. An instrument is then taken in hand which is neither blunt nor sharp and which can be pressed against the finger without cutting it. This is driven through the renal substance down to the stone. A narrow pair of forceps is then inserted and the stone caught and extracted.

If the removal is clean and clear and there is only a mild infection, the wound is closed entirely with one or two mattress sutures. As the bleeding is usually minimal, a single catgut mattress suture may suffice. The external abdominal wound is then closed with a small drain. Sometimes it is of



advantage, if the stone is a little large, to carry the scissors into the pelvis until the stone is touched, and on withdrawing to open them a little, thus enlarging the opening in a blunt way. Such a procedure as this just described is splendidly adapted for the removal of a stone which is out of the calices and not far distant from the cortex. The author has removed in this way, with almost no damage at all, a stone from the upper and lower poles of the same kidney, first tilting up one end and then the other. He prefers this operation also for stone in the pelvis of the kidney, the stone being pushed up toward the dorsum. C. R. O'CROWLEY.

**Unterberg: The Limits of Nephrectomy** (Die Grenzen der Extirpation der Niere). *Gyógyászat*, 1920, xliv, 520.

While operation is necessary even when malignancy of the kidney is merely suspected, and nephrectomy is imperative if the suspicion is verified, a more conservative attitude must be adopted in cases of simple retention and particularly in cases of stone as lithiasis is frequently bilateral and the other kidney may become involved later.

Often by means of nephrotomy, decapsulation, or puncture the organ may be saved. One must be especially careful not to perform a nephrectomy if one kidney has temporarily ceased to function and the cause of the condition is not known definitely.

The author reports 3 cases in which colleagues believed that one kidney was completely destroyed and advised nephrectomy and in which later the kidney proved capable of function (in 2 cases after the passage of ureteral stones; in the third the condition was a simple anuria following ureteral catheterization). Nephrectomy is indicated only when, as the result of disease, the kidney has been destroyed and constitutes a menace to the entire organism (malignancy and tuberculosis).

It is more difficult to decide whether, in bilateral tuberculosis, the more diseased kidney should be removed. The author is of the opinion that in such cases conservatism is indicated even when one kidney has become pyonephrotic by secondary infection. In such cases a nephrotomy should be performed as in this way a large portion of the renal parenchyma will be spared; two poor kidneys are better than one poor kidney.

Unterberg does not believe that extirpation of the more diseased organ will prevent the progress of the disease in the other. Persons with bilateral tuberculosis may live relatively long (the author observed one such case for fourteen years), whereas those in whom bilateral disease was diagnosed before operation usually succumb very rapidly after the operation. However, the diagnosis that a normally functioning organ is tuberculous already can nearly always be made by careful examination. Furthermore, the fact that one kidney is functioning normally and the other kidney is seriously diseased does not exclude beginning disease of the normally functioning organ. POLYA (Z).

**Paschkis, R., and Pleschner, H. G.: A Tumor Primary in the Juxtavesical Portion of the Ureter Simulating a Bladder Tumor** (Ueber einen Fall von primären Uretertumor im juxtavesicalen Teil desselben, einen Blasentumor vortäuschend). *Med. Klin.*, 1920, xvi, 1254.

The patient had been operated on fourteen years previously for carcinoma of the rectum. In a cystoscopic examination made to discover the cause of hæmorrhage from the bladder a large tumor was revealed which seemed to involve the region of the right ureter. A large tumor was palpable also in the region of the kidney on the same side. The latter was exposed by an exploratory laparotomy. It was then discovered that the entire tumor was a carcinoma primary in the ureter causing hydronephrosis.

On the stream of urine strands of tumor tissue had floated into the bladder and evidently were about to set up a secondary growth. The kidney and ureter were removed but the bladder was not attacked surgically. The lower end of the mucosa of the ureter was normal. In the course of the after-treatment the bladder tumor became more and more necrotic and in two months had entirely disappeared. ROST (Z).

**Day, R. V.: Ureteral Transplants for Obstruction of the Lower Ureter.** *California State J. M.*, 1921, xix, 21.

The author reports a short series of ureteral transplantations to the skin of the abdomen. He cites three types of cases in which such transplantation is preferable:

1. Cases of advanced and incurable tuberculosis of the bladder with intractable vesical symptoms, in which both kidneys are tuberculous, or one kidney has been removed and the other has become so involved that it constitutes an exquisitely irritable contracted viscus which is not or cannot be benefited by suprapubic drainage.

2. Cases of trauma and infection on one side in which there is doubt as to the future functional efficiency of the opposite side.

3. Cases of carcinomatous infiltration in the walls and about the lower ureter from carcinoma of the cervix causing extreme obstruction or occlusion and cases of carcinoma of the bladder—male or female—in which the bladder has become highly contracted and so irritable that suprapubic drainage is no longer tolerable.

Five illustrative cases are reported in detail. On the basis of these cases Day's conclusions are as follows:

Transplantation of the ureter to the skin is an act of mercy in certain advanced cases of bladder carcinoma. This is true also as regards certain cases of bladder tuberculosis, in which the procedure prolongs life and lessens invalidism. Life is prolonged by such transplantation also in certain cases of carcinomatous invasion from adjacent extra-urinary organs.



Unlike any other anastomosis of the ureter, the kidney is not injured in the slightest and drainage can be made perfect.

Even bilateral anastomosis to the skin in a one-stage operation is almost devoid of shock to the feeble patient. It is the most rapid and efficient method of treating pyelitis and restoring kidney function to the maximum. G. J. THOMAS.

#### BLADDER, URETHRA, AND PENIS

**Brown, H. H.:** Ectopia Vesicae Successfully Treated by Transplantation of the Trigone into the Sigmoid. *Brit. M. J.*, 1921, i, 15.

Since it is impossible to reconstruct the sphincter in ectopia vesicae, operations have generally been unsuccessful. Transplantation of the ureter into the sigmoid or rectum involves the risk of infection spreading to the pelvis of the kidney. Maydl's operation of transplanting the trigone of the bladder into the sigmoid flexure of the rectum preserves the valvular action of the ureteral orifices. The author reports the case of a 6-year-old girl recently operated on by this method. The upper three-fourths portion of the bladder was completely removed by a semicircular incision carried across the base just above the trigone, and the base of the bladder was raised by dissection, care being taken to avoid stripping the ureters or interfering in any way with their vascular and nerve supply. A loop of the sigmoid was then brought down to the level of the raised trigone, a longitudinal incision was made through the seromuscular coat, and the posterior surface of the upper margin of the bladder was sutured to the bowel with fine silk. The bowel and a portion of the bladder were sewed together. The bowel was then replaced and the abdominal wall sutured.

The patient made an excellent recovery and the bowel retains the urine without leakage for ten hours at night and four or five hours during the day.

A. J. SCHOLL, JR.

**Thomson, J. O.:** Urinary Calculus at the Canton Hospital, Canton, China, Based upon 3,500 Operations. *Surg., Gynec. & Obst.*, 1921, xxxii, 44.

This article is a review of the work done at the American Hospital in Canton, China, from the year 1879 to the present date. It includes a discussion of the history, the development, and the type of operation most frequently used in that hospital.

The author states that for the general surgeon with comparatively small experience in stone work suprapubic cystotomy should undoubtedly be the operation of choice for most cases. It can be performed rapidly and with safety. The whole operative field is visible. Peritonitis can be prevented by careful retraction of the peritoneal reflection and, in cases of large calculi, by fracturing or crushing the stones before extracting them. There is slight probability of recurrence. In cases of large, hard stones, or abnormality or disease of the urethra,

prostate, or bladder, suprapubic cystotomy is the operation of necessity. The operative mortality in 350 unselected cases was 7.8 per cent or, excluding the earlier cases in which it was performed as a last resort and those in which there was pre-existing or concomitant disease, 3 per cent.

Perineal section for the removal of small stones is of considerable advantage and when cystitis is present gives excellent drainage.

Litholapaxy is preferred in a large number of cases by urologists. This method requires a great deal of experience and training, and in the hands of the unskilled is dangerous.

In females a small stone may be extracted through the urethra. The bladder should always be sounded, cystoscoped, or X-rayed to discover the possible presence of stones. A. C. STOKES.

**Beer, E.:** The Technique of the Operative Treatment of Neoplasms of the Urinary Bladder. *Ann. Surg.*, 1921, lxxiii, 72.

Not until recent years has there been any uniformity in the treatment of vesical neoplasms. The introduction of high-frequency cauterization through an operating cystoscope has effected a great change in the management of these conditions. However, the value of this method is limited to certain types of accessible benign papillomata which do not surround the vesical sphincter, are not too numerous or too large, and which develop in a bladder with sufficient tolerance to allow repeated instrumentation. The present problem is the treatment of cases not belonging to this class.

Successful treatment of bladder neoplasms is dependent upon the avoidance of tumor-cell implantation in cases of benign growths and of incomplete removal in cases of infiltrating malignancy.

Beer has devised a technique, the main object of which is to avoid tumor-cell implantation. Its essential points are as follows:

The bladder is gently irrigated and emptied and, with the patient in a moderate Trendelenburg position, is exposed by a suprapubic incision. The urachus is exposed and cut across. The peritoneum is stripped from the posterior aspect of the bladder down to the trigone. This makes it possible to deliver the bladder well out of the abdomen. The perivesical space is packed with several layers of gauze.

The bladder is opened either through the anterior or the posterior wall, depending upon the situation of the growth. The bladder is sponged dry and no intravesical fluid is allowed to flow over the exposed and cut tissues. The tumor thus exposed is at once completely destroyed with the actual cautery.

If the bladder wall is infiltrated, a wide cautery resection of the area is made. Following this procedure it may be necessary to transplant the ureters. The use of forceps with teeth should be avoided. The edges of the incision into the bladder are seared and the bladder is filled with alcohol for five minutes and then allowed to slip back into its bed so



that the perivesical structures will be bathed with the alcohol. This coagulates any tumor cells which may be free.

The charred bladder edges are turned in by means of a catgut suture supported by a second chromic gut suture. The bladder is drained with a rubber tube and the superficial tissues with gauze.

Under certain conditions it is necessary to modify the technique somewhat, especially when the growth is situated on the posterior wall. When this is the case the removal of a section of the peritoneum is necessary.

When the high frequency or operative methods are used in the treatment of benign growths, radium should not be employed. In cases of malignancy with moderate infiltration operation offers more hope than radium. In the advanced cases radium has its place.

HARRY CULVER.

**Jacobs, L. C.: Vesico-Intestinal Fistula.** *California State J. M.*, 1921, xix, 19.

The case reported was that of a man 76 years of age who had been in the best of health for the past twenty years. He denied venereal disease and had never had typhoid fever, dysentery, or other intestinal trouble but had been affected with gout and a persistent psoriasis for a number of years. One night he awakened with an intense desire to urinate, and passed a small quantity of dirty, bloody urine. Micturition was accompanied by burning and pain which recurred throughout the night at intervals of fifteen minutes. After two days the blood disappeared, but the frequency and dysuria persisted and a foul odor and the expulsion of gas were noted at the end of urination. A high temperature accompanied this attack but except for general malaise, there were no other symptoms besides those of urination.

Three weeks later the patient was seen by Jacobs, who found him with a temperature of 100 degrees and much emaciated. He was troubled with a large amount of flatus and gas was expelled from the penis. Nocturia and dysuria were associated with pain during and after urination. On catheterization between 4 and 6 oz. of residual urine were withdrawn. On rectal examination the prostate was found to be normal in size and not tender to palpation. The Wassermann test was negative. The blood showed 3,850,000 red cells, 18,800 white cells, and hæmoglobin 75 per cent. The abdomen was flaccid and there was no rigidity or tenderness. Repeated fæcal examinations were negative as regards the presence of amœba or other parasites.

Cystoscopy revealed a tiny red spot on the posterior wall of the bladder, just above and to the right of the trigone. A worm-like structure was then seen to squeeze itself from a minute orifice and by its own weight was prostrated on the bladder wall. This structure was cylindrical in shape and its movement resembled that of lanoline pressed from a small tube. The intestinal opening of the fistulous tract was not discovered. As the rectum was found normal it

was assumed that the opening in the gut was high up, possibly in the small intestine. There was no dribbling of urine into the rectum and there were no signs of malignancy, strictures, or ulceration in the rectum.

The treatment of vesico-intestinal fistulæ resolves itself into the administration of specific remedies, especially when the etiological factor is a specific disease. The bladder should be frequently irrigated with some antiseptic solution and urinary antiseptics should be given. Careful attention to the bowels and the diet is necessary. The permanent cure of such cases depends upon some form of surgical procedure, either direct closure of the fistulous tract or diversion of the fæcal stream.

LOUIS GROSS.

**Stellwagen, T. C.: The Management of Strictures.** *Therap. Gaz.*, 1921, xlv, 1.

The kind of stricture discussed in this article is the type through which it is impossible to pass an instrument, the so-called "impermeable stricture." This term is misleading and incorrect. No stricture is impermeable through which urine is able to pass, and inasmuch as urine passes most strictures the majority are permeable. Such a thing as an impermeable stricture is possible, however, but as a rule it has been preceded by rupture of the urethra due to external violence or ulceration and internal pressure which has caused the urinary stream to seek a new channel. Whenever urine passes outward through a stricture an instrument may be introduced into the bladder with care and perseverance. Little reliance can be placed on the endoscope and cysto-urethroscope. The many operations for the removal of fibrous tissue and conservation of the urethral mucosa do not seem practical to the author. Much harm can be done and much suffering may be caused by impractical methods in urethral surgery.

The conditions which may cause a stricture to become impassable are numerous. Among them are: extreme contraction of the caliber of the canal; tortuosity of the canal; impingement of tumors and foreign bodies; reticulation and pocket formation within the urethra; false passages; hypersensitivity of the canal; and marked eccentricity of the opening upon the face of the stricture. We must bear in mind also the possibility of urethral fever which may terminate in suppression and death, especially when the patient is feeble; severe and fatal hæmorrhage into the bladder; and the possibility of peri-urethral pockets of infection obtaining access to the blood or lymphatic streams through breaks in the mucosa. Thus great care and gentleness must ever be observed in the handling of strictures.

In the management of apparently impassable stricture it is usually better for the patient to remain in bed. It should be a cardinal rule to make a rectal examination by touch before any attempt to examine the urethra with instruments. The case may be complicated by enlargement of the prostate,



abscess, impacted stone, or other lesions. Prostatic disease has often been mistaken for stricture.

Unless there is acute retention the patient should be kept in bed for a day or two and given some form of sedative mixture. After the prostate and posterior structures of the urethra have been examined, the author gives a combination of sodium bromide, belladonna, and paregoric. When the urethral examination is to be made a dose of morphine may be beneficial. The patient's legs and chest should be kept warm and he should be placed on a hard mattress which does not allow the pelvis to sag into a depression in the bed. The urethra should be irrigated thoroughly with warm boric acid or salt solution, nothing stronger. Careful sterilization of instruments, hands, etc. is essential. All filiform bougies should be tested for tensile strength and examined for rough spots that may scale off. Gouleys should be examined to see that there are no sharp shoulders which will cut the filiform bougies. The patency of all catheters and Gouleys should also be tested.

The urethra should then be filled with a suitable lubricant from the meatus to the face of the stricture. For this, iodoform emulsion in glycerine is of value and tends to prevent chill. As to which instrument should be passed first there is much difference of opinion. It is sound judgment to select the instrument which will pass through the stricture. For this reason the author usually employs the filiform bougie.

The filiform is gently passed down the urethra until it meets with resistance against the stricture. Its passage is then arrested for a few moments until the spasm relaxes. Another filiform is then passed and so on until there is a fasciculus of them almost filling the urethra. Each bougie is then manipulated up and down independently of its fellows. The idea of using so many filiforms and working them independently is that in eccentrically placed canals through strictures it will generally be found that in this way one or more bougies will enter the opening and eventually pass through. The use of filiform bougies with angular tips and corkscrew turns the author has found unnecessary, although he believes they have their place.

If the method described fails there are several other procedures to be tried before cutting is done. An anæsthetic may be given and the same procedure tried again with complete relaxation. At times the author has succeeded by allowing a gentle stream of warm water to trickle into the urethra during the manipulation with the bougies in order to promote relaxation of the spasm. If the bougie is passed into the bladder it is tied *in situ* unless catheterization is necessary, and the patient is placed at rest for twelve or twenty-four hours before any further manipulation is attempted. At the next sitting the author generally succeeds in passing another bougie beside the first, and so on upon succeeding days until he has passed as many as the stricture will accommodate. It is then time

to determine the particular type of the stricture and decide upon the subsequent treatment.

C. R. O'CROWLEY.

**Brennemann, J.:** The Ulcerated Meatus in the Circumcised Child. *Am. J. Dis. Child.*, 1921, xxi, 38.

A peculiar lesion of the meatus urinarius occurring only in circumcised children is characterized by ulceration, crusting and narrowing of the urinary passage; nearly always by pain on urination; often by distention of the bladder; and occasionally, by hæmorrhage. Only in the past year or two has the real explanation of the condition become evident. In 25 or more cases seen by the author recently the lesion was associated with what is known as the "ammoniacal diaper." While the condition itself is rarely, if ever, of serious import, it is usually very troublesome. More commonly it manifests itself as a rather superficial ulceration about the meatus.

From what we know regarding similar ulcers in the diaper region due to the same cause it is probably preceded by a vesicle, as has been pointed out by Zahorsky, though the latter is rarely noticed before it is broken. At times the ulcer becomes deep and extensive, reaching 2 mm. in depth and more than 5 mm. in width. Usually it is more or less covered by a crust which is very firmly attached over a considerable area. Surrounding the ulcer there is often an area of inflammation which involves the adjacent surface of the glans and, extending into the urethral opening, causes narrowing. In the severe cases erythema, vesication, and ulceration of the glans, the scrotum, and the rest of the diaper region are frequently present.

The salty urine coming in contact with the denuded meatus causes acute pain when the child begins to urinate. He therefore immediately stops urinating and cries out with pain. Often the emptying of the bladder is deferred from twelve to eighteen hours. Thus distention of the bladder results. In some cases there is a certain amount of mechanical obstruction due to the narrowing of the meatus or more frequently to the scab which forms on the ulcerated area and is very adherent. Permanent narrowing of the meatus, analogous to a stricture, apparently never occurs even after repeated and prolonged ulceration. If the ulceration is deep and extensive there may be slight hæmorrhage which is noticed especially at the end of urination.

The cause of the ammoniacal diaper which is always the cause of this condition of the meatus is still unknown. In the case of a child which is usually healthy except for constipation, a very strong odor of ammonia is noticed about the wet diaper when it is changed at night or in the morning. The fumes are comparable to those escaping from a bottle of ammonia. They are distinctly irritating to the nostrils and even cause a biting sensation in the eyes. Sometimes this condition is present every night; again it apparently disappears or becomes barely noticeable for weeks and months, only to



appear again with violent manifestations without any known change in the child's health or food. Many children have this ammoniacal diaper for weeks and months without any other unpleasant symptoms. Usually it produces a local redness and subsequent desquamation of a large part of the diaper region. In more severe cases it causes scattered vesication and ulceration. These ulcers may remain denuded for a long time. Often they heal over but remain as discrete nodules during the whole time the ammoniacal condition persists.

The age incidence is of special interest. The condition is almost unknown in the nursing baby, relatively rare in the first six months, and present only exceptionally before the third or fourth month. It is more common in the latter half of the first year, most frequent during the second year, less common during the third, and then soon vanishes.

C. R. O'CROWLEY.

### GENITAL ORGANS

**Bumpus, H. C.: Carcinoma of the Prostate; A Clinical Study.** *Surg., Gynec. & Obst.*, 1921, xxxii, 31.

Bumpus first discusses the history of cancer of the prostate. He then describes the lymphatic drainage of the prostate and states that metastasis into these lymphatic glands is much more common than is usually believed. The glands usually infiltrated by this extension are the inguinal, iliac, cervical, and retroperitoneal glands. The percentages of the cases thus metastasizing as shown in the reports of the Mayo Clinic are given in a table.

The author then takes up the question of the symptoms of cancer of the prostate, tabulating them as follows:

Patients with metastasis with pain—60, or 75.9 per cent of 79.

Patients with metastasis without pain—19, or 24.1 per cent of 79.

Patients without metastasis with pain—97, or 34.3 per cent of 283.

Patients without metastasis without pain—186, or 65.7 per cent of 283.

Total number of patients with pain—157, or 43.3 per cent of 362.

Total number of patients without pain—205, or 56.3 per cent of 362.

Cases are cited in which the entire ascending ramus of the ischium was destroyed.

The pathology of cancer of the prostate is of two types. The first is characterized by the fact that the gland is slightly enlarged and the few local symptoms are due only to metastasis, while in cases of the second type the gland is hard, nodular, and greatly enlarged and the symptoms are those of obstruction. There are also many intermediate varieties. Microscopic examination usually shows that Type 1 is more malignant than Type 2.

Radium therapy is of very little value, but gives more gratifying results in cases of small, smooth,

firm, and well-encapsulated carcinoma than in cases of the other types.

Metastasis to the bones is a fairly common occurrence. The various metastases observed in the Mayo Clinic are given as follows:

	Cases
Vertebrae.....	35
Ribs.....	30
Pelvis.....	26
Femur.....	25
Skull.....	18
Sternum.....	16
Humerus.....	15

The last portion of the article is devoted to a discussion of the symptoms noted in the cases examined in the Mayo Clinic. Urinary symptoms are absent in 11.5 per cent of cases of metastasis.

Neuralgic and rheumatic pains in men above middle age, even in the absence of urinary symptoms, should suggest the possibility of carcinoma of the prostate.

The author appends a table showing the urinary symptoms in 75 cases with metastasis and 283 cases without metastasis as follows:

#### URINARY SYMPTOMS

##### 75 patients with metastasis:

	Cases	Percent- age
Frequency.....	52	65.8
Difficulty.....	43	54.4
Retention.....	20	25.6
Nocturia.....	14	17.7
Hæmaturia.....	6	7.6
Incontinence.....	5	6.4
None.....	9	11.5

##### 283 patients without metastasis:

Frequency.....	183	64.6
Difficulty.....	188	66.4
Retention.....	96	33.9
Nocturia.....	74	26.1
Hæmaturia.....	40	14.1
Incontinence.....	17	6.1
None.....	11	3.8

A. C. STOKES.

#### MISCELLANEOUS

**David, V. C., and Mattill, P. M.: The Role of the Ureteral Lymphatics in Experimental Urinary Tract Infections.** *Arch. Surg.*, 1921, ii, 153.

The authors refer to a previous paper which appeared in *Surgery, Gynecology & Obstetrics* for February, 1918, in which they laid down the following postulates:

1. In experimental bacillus coli cystitis in dogs, blood-stream infection is rare.
2. Without stasis of urine, involvement of the upper urinary tract is rare.
3. With slight obstruction to complete emptying of the bladder, extension of the infection to the upper urinary tract practically always occurs.



4. The involvement of the upper urinary tract almost uniformly takes place through the lumen of the ureter; the ureteral lymphatics are rarely, if ever, the pathway of infection.

The authors have proved these postulates experimentally. They demonstrated that the ureter and the pelvis of the kidney and bladder in the region of the ureter are supplied with lymphatics. In an attempt to determine the round-cell infiltration in controlled ureters with sterile urine in dogs and rabbits they found the presence of infiltration in the ureter in a large percentage of cases in which no infection in the urinary tract could be demonstrated. In an experiment to determine the round-cell infiltration of the ureter with infected urine they injected bacillus coli into a dog's bladder and killed the dog at the end of thirty days. Colon bacilli were then found in the bladder urine, but cultures of macerated ureter and kidney pelvis were sterile.

To demonstrate the development of ulcerative cystitis with ascending ureteral infection but no infection of the ureteral lymphatics or the blood stream one ureter was ligated and divided to establish a hydronephrosis which acted as a control on blood-stream infection. If such infection were present the hydronephrosis would become converted into a pyonephrosis. The urethra was partially constricted by a band of fascia, but not sufficiently to prevent urination. Colon bacilli were then injected into the partially obstructed bladder. Ulcerative cystitis developed with ascending infection involving the unobstructed ureter from which cultures of bacillus coli were obtained. Microscopically there was no cellular infiltration of any type in the ureteral wall although a dense polymorphonuclear exudate was found throughout the wall of the bladder.

To demonstrate that involvement of the upper urinary tract takes place usually through the ureteral lumen the cut end of a ligated ureter was made adherent to infectious material. In this investigation the hydronephrosis which developed above the divided ureter was sterile although micro-organisms were traced to the peripelvic fat. In other experiments on dogs and rabbits infected gauze was placed at the end of a divided ureter. Pyonephrosis developed in each case without peri-ureteral lymphatic or blood-stream involvement.

From these facts the authors conclude that kidney infection by means of the lymphatics around the ureter is exceedingly rare to say the least.

A. C. STOKES.

**McDonagh, J. E. R.: Venereal Diseases as We See Them To-Day.** *Practitioner*, 1921, cvi, 18.

This article is a criticism of the present methods of treating and combating venereal disease. Because this problem was a very active one during the war, it became an official problem and certain set methods were used regardless of the clinical findings.

The author's criticisms are based on pathologic grounds alone. He believes that we are returning

to the old method of treatment which was based on the clinical manifestations. He discusses what has happened, what is apt to happen, and how the old method of treatment can be reconstructed.

The false premises on which our present methods are founded are: (1) that disease can be readily ascertained by a microscopic examination, (2) that treatment can be regulated by blood tests, and (3) that a cure can be determined by microscopic and serologic means.

In McDonagh's opinion only vaccination somewhat similar to that used for the prevention of smallpox will be successful in combating venereal disease. The best method known should be revealed to every patient so that he can protect himself. The propaganda now used is producing a great many venereal neurasthenics.

Free and secret treatment of venereal diseases is a mistake. In the author's hospital experience free treatment was never necessary as most of the patients were perfectly willing to pay.

McDonagh believes that no disease is easier to treat than venereal disease, and that most specialists go through the stage of over-treating gonorrhoea and under-treating syphilis.

Because of the stereotyped courses of treatment which were given during the war—a negative Wassermann test rather than the physical findings being regarded as indicative of cure—recurrences were numerous. Many of these developed in young men who were about to marry and who later infected their wives so that they gave birth to infected children. Treatment was not continued until the patient was clinically free of lues for a long period of time but only until his Wassermann test was negative.

Prolonged treatment which renders the blood negative also means that the patient's resisting substances have been destroyed. All immunity reactions are physical and influenced by the colloidal state of the protein particles in the serum. As treatment is continued, these particles are subdivided and go into solution, in which form they do not exhibit the properties peculiar to them and the reaction becomes negative. In the author's opinion therefore, no light is thrown on what has happened to the organisms which are destroyed by the resisting substance rather than by the treatment.

In the cases seen by McDonagh, 8 per cent of all venereal sores treated as syphilis were wrongly diagnosed and all cases having but one course of treatment relapsed sooner or later. Nineteen per cent relapsed within three months.

Recurrent chancres are one hundred times as frequent now as in 1910. When a case relapses, the blood becomes positive and remains positive for the rest of the patient's life.

A positive test after a prolonged course of treatment indicates that the patient is well protected from a recurrence and vice versa. Sporadic treatment is not satisfactory and is worse than no treatment at all.



In the author's opinion the greatest error of this era is the assumption that the spirochæta pallida is the sole cause of syphilis. The spirochæta pallida is only the adult male of a coccidial protozoön.

McDonagh sharply criticises the plan of not allowing patients to marry until their complement-fixation test is negative. A positive complement-fixation test occurring after the fourth year from the time of infection can never be made permanently negative by treatment.

Emphasis is placed upon the fact that because of the one-course system of treatment and the assumption that a negative Wassermann test indicates a cure, nervous syphilis is twenty times more frequent today than in 1910. Re-infection is a rare occurrence and develops only following intermittent treatment.

In McDonagh's opinion we should follow such clinicians as Fournier and Hutchinson, using salvarsan to get rid of symptoms and employing mercury for long periods. Recurrent cases should be treated symptomatically. This would relegate the complement-fixation test to its proper place; a positive reaction is confirmatory evidence only that the patient has had syphilis some time during his life.

The author allows his patients to marry without a blood test four years after infection or two years after two years of treatment.

In many of the hospitals during the war where only venereal disease was treated, gonorrhœa was over-treated and instrumentation was used to such an extent that the disease was prolonged and complications were frequent.

The stereotyped treatment of gonorrhœa, and especially the methods now used to bring out a latent or non-active gonorrhœa, have done much damage.

In only 10 per cent of the cases in which there is clinical evidence that gonococci are present is it possible to demonstrate the organisms by film or culture. The methods of bringing out an active gonorrhœa increase the over-treatment and are harmful.

The complement-fixation test for gonorrhœa indicates merely that the patient has had gonorrhœa and does not indicate an active lesion. The author holds that there is only one test for cure and that is a thorough clinical examination. Gonorrhœa is not very infectious, being conveyed only during the acute stage. Many patients with a few shreds are treated for too long a time as it is probable that they will always have shreds.

A woman with cervicitis will always have a certain amount of inflammation and discharge.

McDonagh sums up his article by stating: "We should return to where we were some years ago in treating venereal diseases." We should profit by the few advances made in chemotherapy and vaccine therapy, and should regard all pathologic investigations as mere adjuncts to clinical evidence.

As a means of advancing British medicine, the author suggests to the Ministry of National Health,

that an inquiry be made into: (1) the cause of syphilis, (2) the rationale of complement-fixation tests, and (3) the modus operandi of chemotherapy and vaccine therapy.

G. J. THOMAS.

Ivens, F.: A Note on the Use of Antigonococcal Serum. *Brit. M. J.*, 1921, i, 77.

Wassermann showed that the toxin of the gonococcus is contained in the body of the organism and does not belong to the diffusible group. This fact was applied by Rogers and Tory in 1906 in the successful use of antigenococcal serum in the treatment of gonorrhœal rheumatism. Paraf recently pointed out the resemblance between the meningococcus and the gonococcus and emphasized the necessity for methods of applying the serum locally in order to bring it into immediate contact with the microbe. With Nicolle's serum he cured 14 of 16 cases of arthritis in rabbits by intra-articular injections of the serum. The serum is active, possessing agglutinating, bacteriolytic, and bactericidal qualities; it has therapeutic properties against different strains of gonococci.

Ivens employed the serum in about 30 cases, in 22 of which tubal infection was the most marked feature. Endocervicitis occurred in 3, and in 3 there was arthritis which in one instance developed during pregnancy and another in the puerperium.

Three methods of application were used. In one series of cases the serum was given subcutaneously diluted in normal saline, usually in a dose of 20 c.cm. This was repeated at intervals of two, three, or seven days, from 20 to 200 c.cm. being given in all. In another series of cases with dripping pus tubes or pyosalpinx, the tubes were washed with normal saline and a dose of 20 c.cm. of serum was injected into the tubes, some of it into the ovary, and the residue into the pouch of Douglas. The abdomen was closed without drainage and the patient placed in the Fowler position. To avert anaphylactic shock, a subcutaneous or rectal saline injection was given simultaneously as sodium salts have a protecting action against the assaulting infection. In cases of endocervicitis with profuse leucorrhœa serum packs in the vagina alternated daily with packs moistened with equal parts of 10 per cent saline and 5 per cent phenol were used. The results in the cases treated with local applications are particularly good; one woman has become pregnant and another is entirely well after previous ineffectual treatment for two years.

The serum was not used intravenously as fatal anaphylactic shock is apt to result from this method.

With 2 exceptions, the patients were married women; 13 had no children, and 9 each had only 1, a striking percentage of sterility. Subcutaneous injections were used in 19 of the 30 cases, intratubal and peritoneal injections in 6, vaginal packs in 3, and serum dressings in 2 cases of Bartholinitis.

The results show good immediate recovery of all the patients. There were 3 definite failures in the after-histories. One failure, which occurred, in an



acute case, was probably due to the use of an insufficient amount of serum. The other two patients had relapses after several months of good health, but re-infection was probable. Relief from pain was a marked feature in all cases.

These results warrant further experiment and study to determine the best method of administering antigenococcal serum with regard to the site of injections, their frequency, and the amount of the serum to be given. Six special cases are cited.

C. F. ANDREWS.

**Mann, L. T.: The Acriflavine Irrigation Treatment of Gonorrhœa.** *Med. Rec.*, 1921, xcix, 144.

The technique employed by the author is that of Watson. A 1:4,000 solution of acriflavine in physiological saline at body temperature is used once daily. The treatment of acute gonorrhœa of the anterior urethra consists of daily irrigation with 1 pt. of the solution and its retention in the urethra for ten minutes. In addition, the patient is instructed to drink ten or twelve glasses of water daily.

In cases of involvement of the posterior urethra or primary acute anteroposterior urethritis, intravesical irrigations are given immediately unless the symptoms are hyperacute. In cases of subacute or chronic posterior urethritis plus prostatitis daily intravesical irrigations may be given immediately and the prostate may be massaged on the injected bladder twice or three times a week provided there is no acute epididymitis.

Favorable results were obtained by this treatment in a series of 36 cases.

T. F. FINEGAN.

**Reenstierna, J.: The Treatment of Gonorrhœal Complications by the Combination of Antigonococcus Serum and a Temperature-Raising Agent.** *J. Urol.*, 1921, v, 63.

The author reports the result of further work with his antigenococcus serum. In 1916 he gave the results of its use in 120 cases, stating that it had little effect in the open type of gonorrhœa (of the urethra, cervix, ducts of Bartholin's glands, conjunctiva), while in the complicated or closed type of gonorrhœa (arthritis, epididymitis, prostatitis, diseases of the eye and adnexa, infiltrations of Bartholin's glands, and peri-urethral infiltrations) its action was usually very marked.

Because certain cases were refractory and in others expected improvement did not occur, the author attempted to improve the serum, making it of more uniform value. Taking into consideration the sensibility of gonococci to warmth, he added a temperature-raising agent to the serum, especially dead cultures of typhoid bacilli, so that the serum has now a double action due to the effect of the antibodies and fever.

Reenstierna claims that this serum is much superior to his first serum, and reports that it causes very marked and prompt amelioration of symptoms in arthritis, prostatitis, and epididymitis followed in a short time by cure.

The untoward effects of the serum treatment are chills and high fever after the injection, considerable tenderness at the site of injection persisting for some days, and at times a passing tenderness in the inguinal lymphatic glands.

H. L. SANFORD.



# SURGERY OF THE EYE AND EAR

## EYE

Wolff, L. K., and Deelman, H. T.: A Case of Melanosarcoma Conjunctivæ Bulbi. *Brit. J. Ophthalm.*, 1921, v, 4.

The authors report rather fully a case of melanosis occurring atypically in the conjunctiva bulbi and originating from a pigment spot which had been present for ten years. The neoplasm began to grow very suddenly. Following its excision the region was treated with heavy doses of the roentgen ray.

A year later a recurrence developed in the region of the original pigment spot and although the eye was otherwise normal, it was enucleated because it was impossible to determine clinically whether the condition was a recurrence of the tumor or simply a pigmentation due to the X-ray treatment. About a year and a half later a tumor mass was found in the region of the temple. This also was widely excised.

The microscopic examination showed the first tumor mass to be a typical alveolar melanosis. A section through the tumor region of the eye which was removed showed the tumor cells penetrating rather deeply into the sclera at the limbus and following along the path of the blood vessels, some of which were collapsed from the pressure of the cells. The tumor from the region of the temple was a sharply outlined grayish-white mass resembling microscopically the first tumor except that it contained considerably less pigment. T. D. ALLEN.

Gifford, S. R.: *Trichomycetes in Ophthalmology. I. Leptothrix.* *Am. J. Ophthalm.*, 1921, iv, 1.

Gifford reviews the literature rather fully and reports three cases of his own, drawing the following conclusions:

1. A strain of leptothrix was found as the only organism in smears and cultures from the conjunctival sac in a case of recurrent conjunctivitis. It was pathogenic for guinea pigs and showed definite spore-formation.

2. A leptothrix was isolated from a case of chronic meibomitis. It showed definite spore-formation, but was non-pathogenic for guinea pigs, was serologically distinct from the first strain, and presented cultural differences from it.

3. What is probably a leptothrix was found in smears from a second case of chronic meibomitis. It apparently showed true spores.

4. The group of leptothrices includes at least two distinct species and probably more.

The condition was treated successfully by expression and applications of zinc collyrium and yellow oxide of mercury ointment. T. D. ALLEN.

## EAR

Kopetsky, S. J.: Otitis Media in Children—A Critique. *Am. Med.*, 1921, n.s. xvi, 26.

In order to clear up certain misconceptions relative to otitis media in children the author emphasizes the following points, giving the arguments in support thereof:

1. Paracentesis or incision of the drum-head does not prevent operative mastoiditis. The elements which produce mastoiditis requiring surgical intervention are to be found in other factors than in the performance or non-performance of the so-called early paracentesis.

These factors are: (1) the nature of the pre-existing systemic infection, (2) the exhaustion of the body economy by such infection, (3) the character of the invading organism, and (4) the type of the lesion which develops from its initial onset in the mastoid process.

The author deplors the present common practice of opening the ear drums simply because the patient has fever, earache, and a reddened drum without bulging. He states emphatically that paracentesis should be reserved for cases in which pus is present and should not be done for otalgia. In other words, a differential diagnosis between acute catarrhal otitis media and acute purulent otitis media is essential before the proper therapy can be applied.

2. Repeated paracentesis not only is powerless to prevent the development of an operative mastoiditis, but is in itself poor therapy which very frequently results in permanent functional disability.

The author's contention is that if pus is present the drum will not heal, and if the incision closes it is an indication that the middle-ear process is resolving and repeated incisions made in the hope of relieving symptoms supposed to be due to pus retention in the middle ear traumatize an inflamed region and set up just what the operator is attempting to prevent—a mastoiditis. The author is of the opinion that further search will reveal a cause for the symptoms in some systemic infection in an adjoining structure.

3. Mastoid infections in children indicating surgical intervention may be present without pain or high temperature, although the temperature is usually elevated.

More important than the pain is the presence of a profuse excessive discharge.

4. The value of the radiogram for diagnostic purposes in the cases of children is negligible because of the nature of infantile bones and the absence of definite cell structure. O. M. ROTT.



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Santos-Fernandez, J.:** The Measurements of the Nasal Canal According to the Race. *Am. J. Ophth.*, 1921, iv, 32.

This article presents tables showing the frequency of eye diseases in Cuba, especially the frequency of lachrymal diseases in the different races and their relative incidence in whites and negroes. It gives also the results of a series of measurements of the lachrymal canal in full-blooded negroes and whites, and points out the anatomical factors responsible for the greater frequency of lachrymal obstruction among the whites and mulattoes than among the blacks. The author offers the following conclusions:

1. In the white races the nasal canal is longer and follows a more tortuous course. This explains the greater tendency to obliteration or narrowing of its lumen in affections of the lachrymal passages.

2. The nasal canal in the negro is wide and follows a straight course; this explains why it becomes obliterated less frequently than in whites, and accounts for the comparative rarity of sac and duct diseases in the negro as compared with both the whites and the mulattoes.

O. M. Rorr.

**Spielberg, W.:** The Etiology of Deviations of the Nasal Septum: Anatomical Theory. *J. Am. M. Ass.*, 1920, lxxv, 1646.

The author suggests the following theory to explain deviations of the nasal septum:

"The nasal septum divides the bony structure into two compartments. It is surrounded by hard, unyielding bony tissues which begin to ossify from the first to the eighth week of gestation. The septum, composed of the vomer, the perpendicular plate of the ethmoid, and the triangular cartilage, ossifies so far as the bony portion is concerned from the second year to puberty. The cartilage remains soft throughout life.

"It is easily conceived, therefore, that the surrounding bony structures, ossifying at a much earlier period than the bony septum, will cause the septal constituents to deflect or deviate in order to permit it to occupy its proper space. It is as if one should attempt to insert a paper perpendicularly into a box of smaller dimensions. The paper would of course assume the form of an S or bend out with a concavoconvex configuration.

O. M. Rorr.

**Schwartz, A. A.:** Postoperative Nasal Septal Abscess with Latent Sinus Infection; with Case Report. *Am. Med.*, 1921, n.s. xvi, 33.

Forty-eight hours after a submucous resection a septal abscess developed. The symptoms of infection were not relieved until after the flap was laid

wide open and the cavity cauterized with phenol followed by alcohol. Four years previously the patient had had an acute frontal sinusitis which had healed spontaneously. There was no evidence of this trouble at the time of the septal operation. Six weeks previously, the patient had an attack of acute rhinitis, but all symptoms had subsided two weeks before to the operation. A latent infection was present, however, as a nasal discharge persisted after the septal abscess had subsided. The X-ray disclosed a cloudy right antrum, and irrigation revealed pus. This condition was cleared up in due time.

O. M. Rorr.

**Reitter, G. S.:** Rhabdomyoma of the Nose: Report of a Case. *J. Am. M. Ass.*, 1921, lxxvi, 22.

The author's patient, a girl aged 14, gave a history of having been struck on the nose with a ball eight years previously. Eight months afterward a small swelling was noticed which gradually grew to be a good-sized tumor. This growth had always been hard, the skin over it was quite normal, and there was no pain at any time. The diagnosis was made by microscopic examination.

As the child's father refused to consider any surgical procedures, an attempt was made on July 24 and 25 to reduce the neoplasm with radium. Only the gamma rays were used. Three hundred milligrams of radium element screened with 3 mm. of lead and 2 mm. of rubber at a distance of 2 cm. were applied to four areas for a total of 6,500 milligram hours. August 19 the tumor was reduced about an inch in circumference. September 20 the patient's father reported no further change in its size and refused to allow further treatment.

O. M. Rorr.

**Wolf, G. D.:** Round-Cell Sarcoma of the Nasal Vestibule. *Med. Rec.*, 1921, xcix, 178.

The author lays stress on the importance of closer co-operation between the rhinologist and the pathologist. He regrets the tendency to belittle rhinological surgery by operating in the office and deplores the infrequency with which specimens removed are submitted to microscopic examination.

In the case reported the left nostril was filled with an irregular mass which bled easily when touched. Microscopic examination showed the growth to be a round-cell sarcoma and radium treatment was advised. The following conclusions are presented:

1. Whenever feasible, specimens removed from the nose should be submitted to the pathologist. This will prove to be a life-saving measure in some cases and will greatly help in the study of the pathological processes of the nose.

2. In every case of epistaxis with evidence of growth, and in cases in which a growth bleeds pro-



fusely on slight manipulation it is absolutely imperative to submit a specimen to the pathologist.

3. Since chronic inflammation and benign growths of the nose are the only etiological factors known to cause malignancy, the patient must be made to understand the necessity for thorough removal of growths and the eradication of inflammation.

4. It would be an interesting study to investigate all the malignant growths of the submaxillary and cervical glands to determine what proportion of them, if any, originated in the nasal chambers.

O. M. ROTT.

**Lynch, R. C.: The Technique of a Radical Frontal Sinus Operation Which Has Given Me the Best Results.** *Laryngoscope*, 1921, xxxi, 1.

The author describes the technique of a radical frontal sinus operation which has given him 100 per cent cures in a series of 15 cases.

The incision is made as for the Killian or Knapp procedure but at first is not extended outward beyond the supra-orbital notch until this is found by intrasinus measurement to be necessary. Before the incision is made the line of incision is cross-cut to facilitate proper approximation of the skin and deeper tissues. The periosteum is elevated only from the lower half of the incision, great care being taken not to buttonhole the orbital periosteum. This stripping is continued until the most remote area of the orbital sinus wall is exposed.

With a sharp gouge the periosteum over the nasal process of the superior maxilla and the lower edge of the nasal bone in the region of the upper portion of the lachrymal sac and in the area of the superior oblique is elevated. A long submucous elevator is used to expose the lachrymal bone and the lamina papyracea of the ethmoid. This exposed area of bone is removed with the chisel and mallet and rongeur forceps.

The angle between the floor and posterior wall of the frontal sinus must be completely obliterated, especially externally. The mucosa is carefully curetted away with Coakley curettes. A strip of gauze soaked in iodine is then packed firmly into the cavity to prevent the entrance of infection into this area from below and to control bleeding.

The roof cells of the ethmoid are next cleaned out and then the postethmoid sphenoid cells and every vestige of mucosa. Finally the anterior wall of the sphenoid is removed. After the raw bone surfaces have been sponged with tincture of iodine, a large drainage tube  $\frac{3}{8}$  in. in diameter with one end cut on a long bevel is passed through the vestibule of the nose and into what was the area of the beginning infundibulum of the sinuses. The iodine gauze is then removed from the upper portion of the sinus wall and the entire cavity is swabbed with iodine.

Interrupted catgut sutures are placed to bring the subcutaneous tissues together, but the needle point is not permitted to pass beneath the periosteum of the upper half of the incision. The skin is brought

together with metal clips. No external drainage is necessary. A sterile probe is passed through the tube daily for five days. The tube is then removed and a large dilator is placed in the sinus for ten days. No washing of the sinus or nose is permitted.

O. M. ROTT.

**Hope, C. W. M.: Lymphosarcoma of the Postnasal Space.** *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Sect. Laryngol., 6.

The postnasal space was occupied by a large bluish-red mass which pushed down the soft palate. The soft palate was invaded also by a large mass behind the left posterior pillar of the fauces. A smaller mass was found on the right side in the sinus region. The Wassermann test was negative. On both sides of the neck, in front and behind the sternomastoid and extending down to the clavicle, were scattered palpable glands. The microscopic examination of one of these removed from the left side was lymphosarcoma.

On Sept. 23, 1920, 60 mg. of radium in two tubes screened with 1 mm. of silver were buried in the postnasal growth for six hours. On September 29 and October 5 the neck was treated with the X-rays. On October 9, 30 mg. of radium screened with 1 mm. of silver were introduced into the postnasal space and 30 mg. buried in the left posterior pillar for six hours, 1 mm. silver screen being used. On October 12 the neck was again treated with the X-ray.

On October 19 the postnasal space was absolutely free from tumor, the pillars were very much smaller, and the glands in the neck were reduced two-thirds. All nasal obstruction had disappeared.

O. M. ROTT.

## THROAT

**Thompson, J. A.: A Simple, Bloodless Tonsillectomy, with a Simple, Safe Local Anæsthesia.** *Laryngoscope*, 1921, xxxi, 26.

The author explains why the method of injecting the tonsil recommended by Rosenblatt is so successful. Just external to the constriction muscles of the pharynx is a connective-tissue space in which lie the vessels and nerves of the tonsil in the neck. Just external to the anterior pillar this space is covered only by mucous membrane. When a needle is inserted to the depth of 1 in., its point being directed slightly away from the median line, the injection made into this connective-tissue space will surround the glossopharyngeal nerve and the nerve will be blocked.

O. M. ROTT.

**Morris, W.: Dissection of the Fauical Tonsils under Local Anæsthesia.** *Lancet*, 1921, cc, 169.

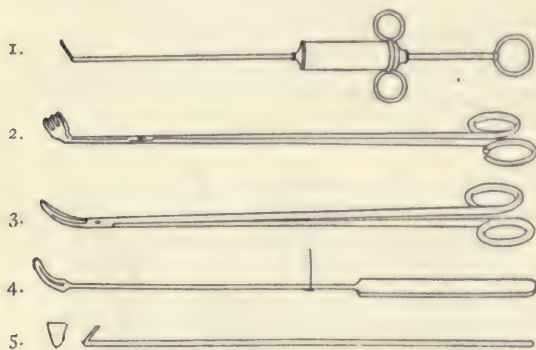
Morris describes the technique adopted in the Mayo Clinic for complete removal of the tonsils in adults.

The technique is simple and easily carried out. It is preferable for small fibrotic tonsils or those in which only the bases are left after enucleation by Sluder's method has been attempted by an inex-



perienced operator. Sluder's technique is preferable if there is sufficient tonsillar tissue to protrude through the ring of the guillotine and to dislocate forward in front of the alveolar process.

In 72 operations witnessed by the author no ill effects were observed from the injection of one-fifth of 1 per cent cocaine. Hæmorrhage is negligible and easily controlled by ligation. It requires about two minutes for the operator to remove each tonsil. Patients state that the procedure is painless. The operator has an excellent view of the field during the entire operation. All patients are placed in the sitting position. The following instruments are used: (1.) an all-metal syringe with a shank 8 in. long, and a needle  $\frac{1}{4}$  in. long at an angle of 45 degrees to the shank (Fig. 1); (2) a tonsil forceps (volsellum type), 8 in. long with blades  $\frac{3}{4}$  in. long, curved at an angle of 45 degrees to the shank, and jaws opening laterally (Fig. 2); (3) a scissors, 8 in. long with blades  $\frac{3}{4}$  in. long, curved on the flat to an angle 45 degrees and points medium blunt (Fig. 3); (4) a dissector, 8 in. long, with a flat blunt-pointed blade,  $\frac{3}{4}$  in. long, curved on the flat to 45 degrees, both edges sharp (Fig. 4); (5) a tonsil clamp with an  $\frac{1}{8}$ -in. crushing surface; (6) a fine-pointed artery forceps; (7) a pillar retractor (Fig. 5); and (8) a coarse wire snare.



The tonsil is firmly grasped with the volsellum forceps and pulled toward the midline. The capsule is then cut with the scissors in the supratonsillar fossa. The blunt point of the dissector is introduced into the opening thus made and the tonsil is separated from the anterior and posterior pillars by cutting the mucous membrane in a downward direction in front of and behind the tonsil. This can be done equally well with the scissors by inserting the closed points into the opening in the supratonsillar fossa and opening the blades in front of and behind the tonsil.

The tonsil is separated from its bed by small nibbling cuts with the scissors, the separation being begun at the upper pole and carried downward for about two-thirds of the extent of the bed. The tonsil is next pulled well toward the midline and the

clamp is applied to the remaining undetached portion of the base. Removal of the tonsil is completed by passing a coarse wire snare over the volsellum forceps, cutting through the remaining portion of the bed, and removing the clamp. Some operators prefer the snare rather than the clamp and ligate all bleeding points afterward. The whole of the tonsillar fossa can then be exposed by pulling the anterior pillar forward and outward with the pillar retractor. Bleeding points may be measured and ligated.

J. C. BRASWELL.

**Comby, J.: The Treatment of Retropharyngeal Abscesses** (Traitement des abcès rétropharyngiens). *Presse méd.*, Par., 1920, xxviii, 1769.

Retropharyngeal abscesses occur very frequently in young children and call for immediate operation. In Comby's opinion every throat abscess, whether tonsillar, paratonsillar, retrotonsillar, or pharyngeal should be opened with a soft instrument rather than with a sharp or cutting instrument. The bistoury should be replaced by the cannulated sound and a hæmostatic forceps. This method decreases the danger of hæmorrhage, is within the scope of any practitioner, and is always successful. The author's procedure is described as follows:

1. The operative field is cleansed by swabbing the throat with a mixture of iodine, potassium iodide, and glycerine.
2. The child, held by a nurse, is placed opposite the operator who holds a tongue depressor in the left hand and a cannulated sound in the right. The abscess is exposed by depressing the tongue and the sound is pushed into it.
3. The head is then immediately bent forward to prevent the entrance of pus into the respiratory tract and to facilitate evacuation. The small orifice of the sound is rapidly enlarged with a hæmostatic forceps and the pus drained entirely.
4. The throat is irrigated.
5. Repetition of these manœuvres may be necessary.
6. If the abscess cannot be found at once in the cases of very young children the cannulated sound is pushed in different directions until it is discovered. Such attempts are inoffensive when a sound is used but would be impossible with the bistoury.

W. A. BRENNAN.

**Hill, W.: Multiple Polypi of the Deep Pharynx.** *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Sect. Laryngol., 2.

The patient, aged 55, had suffered for several years from frequent attacks of coughing and suffocation during which there seemed to be a lump in the throat which moved about. On endoscopic examination a pedunculated polypus was regurgitated from the gullet into the pharynx. This was removed by means of a snare and an elongated Struycken scissors. Sessile growths from the left pyriform sinus were removed with a punch forceps.

O. M. ROTT.



## MOUTH

**McClary, S., III.: Focal Infection of Oral Origin.**  
*Internat. J. Orthodont. & Oral Surg.*, 1921, vii, 31.

McClary reports that the principal regions in which we find foci of infection are the genito-urinary tract, the nasal accessory sinuses, the tonsils, and the teeth; consequently the oral surgeon and dentist should be alert to detect these conditions in the mouth and should know how best to correct them.

The author doubts that most apical abscesses can be cured by drainage through the root canal; an apicoectomy may eradicate the infection if the abscess cavity is accessible and can be thoroughly curetted, but as in many cases there is a pericemental abscess it is advisable to remove the tooth.

Seventy-five per cent of infections in the antrum come from diseased teeth. When such teeth are extracted, the sockets should be carefully disinfected and explored with a sterile probe in order to determine whether there is an entrance into the antrum. If the infection extends into the antrum it is best to enlarge the opening for drainage.

Where there is no necrotic bone in the antrum and it is not filled with polyps, drainage through the alveolar process is usually sufficient, but when either of these conditions is present, it is best to do a radical operation, such as removing the anterior wall of the antrum in the region of the canine fossa.

The tonsil also should be considered as a factor in systemic infection. The removal of the tonsils is indicated by the following conditions:

1. When in a child, the tonsils are large enough to interfere with respiration.
2. When a child has suffered from a serious systemic infection such as endocarditis or acute nephritis following an attack of tonsillitis.
3. When a cervical adenitis is present and the tonsils show evidence of either acute or chronic inflammation.

4. In all cases in which the tonsils are chronically infected as evidenced by congestion about them and the presence of cheesy accumulations.

M. N. FEDERSPIEL.

**Chubb, G.: An Operation for the Radical Cure of Pre-Masseteric Fistulae of Stenson's Duct.**  
*Brit. M. J.*, 1921, i, 45.

The number, the varied character, and the drastic nature of operations described for the treatment of pre-masseteric fistula of Stenson's duct indicate their uncertain value. The ideal operation permits the restoration of the continuity of the duct. This, however, is always difficult and frequently impossible. An alternative consists in dissecting the duct and implanting it into the mouth. If this fails, the recommendation is made to ligate the duct (with the risk of abscess formation) or to dissect the gland out as thoroughly as possible without injuring the facial nerve.

The technique used by the author is described briefly. Two horizontal incisions are made 1 in. apart above and below the fistula and the small section of skin containing the fistulous opening is isolated by two vertical incisions between the others. The anterior end of the duct is dissected down to the oral cavity. Mattress sutures are passed through the anterior and posterior edges of the button of isolated skin and then brought through the skin and tied on the oral mucous membrane. This brings the duct opening into the oral cavity in its natural position. By undermining the skin edges of the primary incisions they may be brought together over the duct.

The author has operated on three patients by this method with good results. The procedure may be recommended for its simplicity and reliability. It permits complete removal of the fistula with the surrounding scar tissue and allows primary union of the remaining linear incision. MERLE R. HOON.



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# INTERNATIONAL ABSTRACT OF SURGERY

JUNE, 1921

## ABSTRACTS OF CURRENT LITERATURE GENERAL SURGERY—SURGICAL TECHNIQUE

### OPERATIVE SURGERY AND TECHNIQUE

**Morris, R. T.:** Where the Rubber Glove Is Behind the Times. *Am. J. Obst. & Gynec.*, 1921, i, 334.

The rubber glove belongs to standardization and is one of its most valuable adjuncts. The standardization idea in every field of human activity represents a great moving force of recognized value, but has its limitations.

With the introduction of the rubber glove came the longer incision in abdominal surgery. Abdominal surgeons lost their cunning because the sense of touch was interfered with to such an extent that it became necessary for them to do much of their work by the sense of sight.

In order to determine the degree to which rubber gloves actually interfere with the tactile sense Morris had tests made by an expert upon several physicians and surgeons. All of these tests showed a lowering of the tactile sense, even in very expert surgeons, and curiously enough, the physician who stood highest in the tests was not a surgeon but a specialist in diseases of children.

To determine whether the rubber glove lessens the number of bacteria which are carried into an abdominal wound culture media were exposed in Petri plates in the operating room. The larger the Petri plate the more complete the infection of its contents, and the longer the exposure of the Petri plate the more complete the infection of its contents.

This infection came from bacteria which fell from the air into the culture medium. More bacteria fall into a large abdominal incision from the air than are carried in by well-prepared hands without rubber gloves. Most of the bacteria which fall into a wound from the air or are carried in by the hands are destroyed or at least rendered latent by the enzymes of the wound.

Rubber gloves have incidentally been a factor in making this a day of instruments in the abdominal cavity. Surgeons are prone to forget that the peri-

toneum with its lymph system is better equipped than the skin for resisting infection. The extent to which the peritoneum will ward off or control infection is remarkable provided it is not shocked by undue manipulation.

In cases of acute perforation of the bowel due to typhoid or gastric ulcer, a two-minute operation by a surgeon wearing no gloves will be of greater benefit than a thirty-minute operation by a surgeon wearing gloves and working by sight.

Morris does not oppose the use of rubber gloves, but he believes that they are behind the times when they come into conflict with the principles of the fourth era of surgery in abdominal work. The fourth era is the physiologic era of surgery, in which the patient is turned over to himself with the least possible injury to his natural protective resources. He then manufactures phagocytes and opsonins freely if his endocrine functions have not been disturbed by severe shock.

M. I. MALONEY.

**Mayo, W. J.:** Mortality and End-Results in Surgery. *Surg., Gynec. & Obst.*, 1921, xxxii, 97.

Much may be learned by a study of the mass of surgical material which passes through an institution. In order to secure a perspective which will not be distorted by the minutiae, the mass rather than the details must be considered. Such an investigation will sometimes show a way by which an intensive study of outstanding failures may be made to yield valuable suggestions. The author has been impressed with this fact by a survey of the statistics for the year 1919 from the institutions in Rochester. These statistics indicate that many poor end-results and some deaths apparently due to accidental or unpreventable causes occur with a regularity so definite that their incidence can be foretold from year to year. That which can be foreseen can be prevented.

In 1919, 10,280 operations were performed by ten surgeons working under similar conditions in St. Mary's Hospital. The death rate was 1.7 per cent.



Five thousand, six hundred and seventy-one of the 10,280 operations were performed for conditions involving the abdominal cavity; these cases are discussed in this paper.

In 265 operations performed on the ovaries and tubes the death rate was 0.7 per cent. The end-results of such operations on the pelvic organs of women, however, are by no means comparable with the low mortality. The disturbance of the endocrine functions in which the ovary plays so important a part, especially in young women, leaves serious neuropathic sequelæ, and an intensive study of conservative methods by which such sequelæ can be averted is of relatively greater importance than the study of the mortality.

Five hundred and thirty-nine hysterectomies were performed for benign disease, with a death rate of 1.6 per cent. Because of the abolition of menstruation in such patients there is again the necessity for the study of more conservative methods in order to prevent the type of endocrine disturbances which occur after radical operations on the ovaries and tubes, and to heighten the interest in conservative myomectomy for fibroids instead of destructive measures such as hysterectomy and treatment with radium.

Ninety-six hysterectomies were performed, without a death, for carcinoma of the uterus. This statement without explanation would be the truth, yet it might lead to false conclusions. The remarkable effect of radium in certain cases of cancer of the cervix has revealed that radium is an agent which can be applied successfully to the treatment of a large group of advanced carcinomata of the cervix which formerly gave a high operative mortality.

In the series of 10,280 operations 1,000 cholecystectomies were performed with a death rate of 1.6 per cent. Following cholecystostomy the gall-bladder is a liability rather than an asset. Drainage herniæ, which are ordinarily unimportant, may be of great importance in obese persons. Drainage is unnecessary in the average cholecystectomy and should be used only when the indications are definite.

One hundred and thirty-nine operations were performed for stones in the common and hepatic ducts, with a death rate of 8.6 per cent. This rate is high. Many of the patients were in wretched condition from cachexia, jaundice, and nephritis.

Seven hundred and eleven operations were performed on the duodenum for acute and chronic ulcers and their complications. The death rate was 0.9 per cent. The end-results are satisfactory in 95 per cent of cases with demonstrated ulcers. The greater number of patients who have trouble following operation develop it within the first year.

One hundred and sixty-three operations were performed for gastric ulcer and its complications, with a death rate of 2.4 per cent. The end-results of operation for gastric ulcer are about 85 per cent satisfactory. The permanent crippling of the stom-

ach produced by the ulcer and the liability to cancer are two factors which cannot be ignored.

One hundred and five resections of the stomach were performed for cancer, with 10 deaths (9.5 per cent).

The radical operation was performed, with 12 deaths, on 63 patients with carcinoma of the large intestine, and with 7 deaths on 70 patients with carcinoma of the rectum and rectosigmoid. Preliminary colostomies for obstruction, and subsequent operations besides the radical operation, sometimes three or more on a single patient, are counted as one case. It is difficult to justify this mortality rate, but the fact stares us in the face that operations even in advanced stages of this dreadful malady have resulted in permanent cures when the condition left alone makes death a friend.

It is well known that in these areas which are grossly infected normally carcinoma involves the glands late, that often when the glands are apparently involved they show only infection, and that the fixation and involvement of the surrounding tissues may still leave the disease local. The end-results have been so remarkable as to justify the primary mortality. Fifty per cent of the patients subjected to radical operations for cancer of the large intestines lived five years or more and 70.8 per cent of those without glandular involvement were cured. The two chief causes of death following operation in these cases are sepsis and secondary pulmonary complications due to minute septic emboli from infected thrombi. Such pulmonary complications are too frequently attributed to the anæsthetic. They have been found quite as frequently in cases in which local anæsthesia was used. The mere act of handling such infected masses endangers the lungs and gives rise to pulmonary complications, the means rather than the cause perhaps by which the lethal end is produced. The peritonitis found at necropsy may have the same relation to the operation, that is, it may not be a primary death-producing peritonitis but is essentially terminal.

**Skilern, P. G., Jr.: Two Suggestions in Abdominal Operative Technique: Peritonealization by the Suspensory Ligament of the Liver after Cholecystostomy or Choledochostomy; Utilization of the Round Ligament of the Uterus with the Cremaster in the Repair of Femoral Hernia.** *J. Am. M. Ass.*, 1921, lxxvi, 445.

Skilern offers two suggestions for abdominal operative technique which, as far as he is aware, are original with him.

The first suggestion is peritonealization by means of the suspensory ligament. Skilern employed this method in the case of a woman, aged 47, whose common bile duct was dilated to the size of a man's thumb and contained six stones each as large as the thumb nail. Following the extraction of the stones through an incision in the common duct the gall-bladder was removed. A rubber drainage tube



$\frac{1}{4}$  in. in caliber was then inserted into the common duct and the duct closed up to the tube. The tube was brought out through an opening made in the suspensory ligament just to the left of the round ligament. The suspensory ligament was held in juxtaposition to the common bile duct by a catgut suture. Five days after the operation, while the patient was being transferred to another floor, the tube slipped out of the bile duct. Thirteen days after the operation, the bile no longer escaped from the fistula.

The suspensory ligament with its two layers of peritoneum enclosing subserous fat and with its free border reinforced by the strong round ligament forms an ample and ideal sealing medium. Furthermore, by means of its anterior parietal attachment, it protects the left upper abdomen from the spread of infection. Thus the bile-duct fistula becomes closed not alone by proliferation of the mucosa, but also by peritonization by the suspensory ligament.

The author applied this method also in a cholecystotomy performed the day this article was written. The round ligament was sutured to the gall-bladder, to the right of the ostium, so that the suspensory ligament formed a perfect cap for the fundus of the gall-bladder. In the center of the cap the ostium was made. This should prevent the formation of adhesions.

The second suggestion is the utilization of the round ligament with the cremaster in the repair of femoral hernia. This method was employed in the treatment of an incarcerated femoral hernia containing the cæcum and omentum in a woman aged 60. In the right groin was an "irreducible" swelling the size of two fists. Under local anæsthesia the hernia was approached by the inguinal route of Ruggi, a descending vertical incision being made also through skin and fat to isolate the sac. When the sac was opened a large quantity of turbid serum escaped. The incarcerated portion of the omentum was ligated and the stump pushed up into the peritoneal cavity.

The wall of the cæcum was so thickened by cedematous infiltration that it was impossible to reduce it without preliminary division of Poupart's ligament. After the reduction of the cæcum there remained a large, wide-open passageway between the abdomen and the thigh. Closure of this passageway could not be effected by mere suture of the divided ends of Poupart's ligament. The author therefore decided to employ the round ligament from which the cremaster muscle and fascia had not been separated. The femoral vein being retracted laterally, the free border of the round ligament was sutured to the underlying pectineus fascia from the vein almost to the pubic bone with interrupted sutures of No. 2 chromic gut. Over this the divided ends of Poupart's ligament were sutured and the superficial tissues approximated. The patient was up and about at the end of two weeks.

M. I. MALONEY.

## ANÆSTHESIA

Labat, G. L.: *Regional Anæsthesia*. *Ann. Surg.*, 1921, lxxiii, 165.

Local anæsthesia for minor operations has reached a high degree of perfection. In major operations, however, preliminary psychic treatment and education in the hospital are necessary unless the patient comes from a community where it is in general use. Crile's "anoci-association" is a combination of local and general anæsthesia. Local anæsthesia blocks nerve conduction, thus protecting the brain from the effects of local operative injury, while the general anæsthetic used with it excludes the psychic stimulation of the brain cells.

In the cases of patients with lowered resistance, auto-intoxication, abnormal metabolism and oxygenation, the advantages of regional anæsthesia are obvious. Regional anæsthesia affects a comparatively small part of the body and leaves the central nervous system unaffected. The degree of pain in operations is not proportional to the intensity of the trauma. Individual differences are well marked and depend on many factors, the chief of which is the emotional element. Apprehension may be so great as to interfere with the necessary manipulations in local and regional anæsthesia. In some cases the consciousness of the performance of the operation is a drawback in spite of the absence of pain. The sensation of touch may be interpreted as pain. A few whiffs of ether generally suffice to quiet such patients.

Another class of patients ask to be anæsthetized locally and then faint or request a general anæsthetic when taken to the operating room. It is therefore advisable to blunt consciousness in every case by giving a hypodermic of scopolamine 0.0002 gm. and morphine 1 cg. one hour before anæsthesia is induced. The patient should then be kept in a darkened room until he is wheeled to the operating room on a stretcher. The injection is not meant to produce twilight sleep, but to abolish fear, anxiety, and uneasiness.

Novocaine is used almost universally as it is ten times less toxic than cocaine. Analgesia so induced is delayed and of briefer duration, however, so that adrenalin must be added to accelerate and increase the effects of the novocaine. Twenty to 30 drops of a 1:1,000 solution of adrenalin are added to 100 c.cm. of the novocaine solution regardless of its concentration. This dose is decreased one-half for children and old persons. Solutions of cocaine and novocaine or cocaine alone produce symptoms of excitement, dyspnoea, cardiac distress, etc. These drugs were abandoned, therefore, in favor of novocaine and adrenalin. Cocaine should never be used in regional anæsthesia.

The strength of the solution varies with the technique; 0.5 per cent is used for the subcutaneous infiltration; 1 per cent for paravertebral, caudal, and muscular injections, and for anæsthesia of the head, hand, and foot; 2 per cent for caudal injections and



for blocking the brachial plexus and the great nerve trunks; and 5 per cent for surgery of the eye.

Glass syringes with wing grasps for the fingers and long, thin, flexible, nickel-plated steel needles are best. The attachment of the needle to the syringe should be excentric.

Gentleness is a requisite of the anesthetist. Before anesthesia is begun the patient should be warned that he will feel a few light pricks of the needle and the sensation of touch and pull will not be abolished. The ears may be plugged with cotton and the eyes bandaged. Accurate anatomical knowledge of nerve distribution and location is necessary. Anesthetic wheals should be made where the skin is to be punctured. As the periosteum is very sensitive, bones should be approached lightly with the needle. Infiltration should be slow, steady, and continuous as the needle is advanced and withdrawn.

When the needle is to be introduced near large blood vessels it should not be attached to the syringe previous to its insertion. It must be ascertained that it has not entered the lumen of a blood vessel, and if blood is present, it should be withdrawn a little. If necessary to pass the needle deeper, its direction should be changed slightly. A small hematoma is of no importance, although it may interfere slightly with the anesthesia. It is advisable to aspirate by withdrawing the plunger of the syringe slightly before injecting. Ten minutes should be allowed for the induction of complete anesthesia. Sharp instruments should be used and the tissues handled as gently as possible. Incisions should be longer than when a general anesthetic is used.

Nerve blocking may be accomplished in four ways:

1. By blocking the nerve terminals in the vicinity of the operative area.
2. By blocking the nerves at any point between the spine or skull foramina and the area they supply.
3. By blocking the nerves within the spine but outside the dura mater. This procedure is called the extradural, epidural, or sacral method.
4. By blocking the nerves within the dura. This procedure is known as intradural or spinal analgesia.

MERLE R. HOON.

#### SURGICAL INSTRUMENTS AND APPARATUS

**Menard, P.: A Hot Air Alcohol Cautery** (*Cautère à air chaud fonctionnant à alcool*). *Presse méd.*, Par., 1921, xxix, 176.

The principle of the hot air cautery described by Menard consists in passing compressed air into six small copper tubes which are heated by a powerful Bunsen alcohol-vapor lamp. The apparatus supplies pure and dry air free from the products of alcohol combustion at a temperature ranging from 600 to 800 degrees. It is of small size and easy to operate. The Bunsen flame is entirely enclosed within the cautery. There are three principal parts to the cautery: the Bunsen lamp or alcohol reservoir;

the cautery proper; and the air-compressing portion consisting of a simple rubber bulb and tube.

This apparatus makes it possible for the practitioner himself to treat many clinical conditions (rheumatism, slight gangrene, etc.) by thermotherapy.

W. A. BRENNAN.

**Ratner, A. B.: A New Apparatus and Method for Puncturing the Superior Longitudinal Sinus in Infants.** *Am. J. Dis. Child.*, 1921, xxi, 199.

The apparatus devised by Ratner consists of a small metal block,  $\frac{3}{4}$  in. wide and thick and  $1\frac{1}{4}$  in. long, with an acutely beveled base. Through the middle of the block runs an opening of 18-gauge bore which permits the insertion of the needle. The needle is  $1\frac{3}{8}$  in. long and has a Luer-slip hub and a short beveled point. After it has been adjusted to the desired length it is held securely in place by a thumb screw.

The first step in using the apparatus is to determine the depth of the sinus as this varies somewhat in different infants. The author pinches up a portion of the scalp; half the thickness of the fold gives the approximate depth. The needle is then adjusted to the correct length and the set screw is tightened, the bevel of the needle being kept in the same direction as the bevel of the block. Tobler's measurements show that the distance from the skin to the sinus is between 2 and 5 mm., and at the posterior angle the depth varies between 4 and 7 mm., depending on the infant's age and size.

The point of entrance is chosen near the posterior angle of the fontanel along an imaginary line drawn between the middle of the bridge of the nose and the posterior angle of the fontanel. For the administration of fluid the apparatus is forced in up to the end of the block. If the sinus has been successfully entered, there will be an immediate and steady flow of blood. The end of the block now being used as a fulcrum, the apparatus is quickly turned so as to bring the beveled surface of the block in close apposition to the scalp. A syringe or gravity apparatus is immediately attached to the hub, and the fluid is administered in the usual manner.

When the operation is completed the needle is withdrawn, a compress is held firmly over the bleeding point, and the child is raised to the sitting position. After the bleeding has stopped, collodion is applied.

The advantages of this apparatus are that it is of simple construction and the needle is always in view when it is being inserted and can be held comfortably and firmly in place. The end of the block keeps the needle from entering too far and serves as a fulcrum upon which the block turns, automatically causing the needle to assume a plane in the direction of the sinus. The beveled surface lying flat against the scalp prevents lateral movement and keeps the needle steady. Any ordinary needle with a short bevel up to an 18-gauge may be used.

M. I. MALONEY.



## SURGERY OF THE HEAD AND NECK

## HEAD

**Doyle, A. S.: Traumatic Pneumocranium.** *Am. J. Roentgenol.*, 1921, n.s. viii, 73.

The subject of traumatic pneumocranium is interesting inasmuch as only a few cases of this condition appear to have found their way into medical literature within the past decade. In one case reported by Stewart, as also in the author's case, the condition was not suspected clinically. It is possible, however, that many cases of this condition present no clinical symptoms which would cause the patient to have an X-ray examination, pass unrecognized, and end in complete recovery. In a case reported by Potter recovery resulted without surgical interference. There were no serious symptoms at any time. Subsequent examinations showed absorption taking place.

The author's case was that of a man who was struck by an automobile, receiving lacerations of the scalp in the supra-orbital region. After remaining unconscious for several days, he regained consciousness and complained of constant and severe headache in the left frontal region. No operation except the suturing of the wound was performed at the time of the accident. Subsequently various nervous and mental symptoms developed and became progressively worse. In a roentgen examination made about three months after the accident a fracture in the left frontal and temporal region and a large air cavity were revealed. At operation the dura was found to be tense and under pressure. When it was opened, air rushed out with a hissing sound. The brain tissue in the area involved was soft and lacked its normal resiliency. Death occurred the following day.

At autopsy two openings through the dura and a depressed fracture above the outer half of the orbit extending to the temporal region in one direction and toward the cribriform plate of the ethmoid in the other were found. The fracture opened into the ethmoid sinuses. A probe inserted found free passage into the nasal cavity on the left side. Considerable thick mucus was discovered in this passage. This probably acted as a valve, admitting and confining the air.

The unusual features of the case were: (1) the length of time the patient lived with a gradually increasing air cavity into which air constantly gained admission from the ethmoid cells and from which it could not escape, and (2) the fact that the true condition was not suspected.

ADOLPH HARTUNG.

**Guenzel, R.: Acquired Internal Hydrocephalus** (Beitrag zur Lehre vom erworbenen Hydrocephalus internus). *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1920, lxi, 120.

A soldier who had had typhus a few months previously had a chill followed by stiffness of the

neck, increased reflexes, fluttering of the lids, and trembling of the tongue. The signs were thought to be due to hysteria and led to his discharge from the army. After a time he had continuous headache associated with vomiting, double vision, stumbling gait, frequent attacks of dizziness, and psychomotor excitement. He then had a high tension pulse, choked disc, sensitiveness of the skull when it was tapped, weakness of the legs, ptosis, cerebellar ataxia, and faulty co-ordination. The cerebrospinal fluid was almost normal. An operation was decided upon but death occurred while a scopolamine-morphine injection was being given.

As the symptoms could not be attributed to any disease of the cerebrum or cerebellum, it was assumed that they were due to pressure caused by internal hydrocephalus. The development and the objective symptoms indicated this. The slight pressure in the spinal fluid indicated that there was an absence of communication between the ventricle and the subarachnoid space. Autopsy confirmed the correctness of this diagnosis. The cause was found to be granulation nodules in the foramen of Magendi, the exact nature of which could not be determined.

Acquired internal hydrocephalus arises from: (1) increased formation of fluid; (2) interference with the discharge of the fluid; and (3) decreased resistance of the ventricle wall. The case reported belongs to the second group. In some cases of this group tumors and cysticerci have been found in a similar situation. Cases with such a cause do not show the remissions lasting for years which are sometimes observed in the so-called idiopathic cases.

It is not known to what extent the injection of scopolamine was responsible for the sudden death in the case reported, but the author states that it is advisable not to use much morphine in severe injuries of the brain.

KOENIG (Z).

**Viets, H.: A Note on Gliomata, with Report of a Case.** *Boston M. & S. J.*, 1921, clxxxiv, 150.

Attention is directed to a type of cerebral glioma which may invade and replace part of a hemisphere and then enter the subarachnoid space. Once within this space it has a striking tendency to extend along the serous surfaces without extending beyond them or penetrating into the adjacent structures.

A case of this type of glioma is reported. The circumscribed tumor replaced part of the right temporal lobe and invaded the subarachnoid space at the level of the pons, markedly compressing this structure. There was no invasion through the resistant pial membrane once the tumor entered the subarachnoid space. The new growth then extended cephalad over the base of the brain and caudad to the conus terminalis, never penetrating the pia except at the pontine angle, where there was a slight



invasion of the cerebellum. There was a combination of both brain and spinal cord symptoms, including loss of consciousness, dizzy spells, headache, vomiting, choked disc, hallucinations of tasting gas and smelling tar, left homonymous hemianopsia, and right hemiplegia.

The pathology explains all the signs except the right hemiplegia. Unfortunately the surgeon was led astray by this sign and did a futile exploration of the left parieto-temporal region. The hemianopsia and uncinat attacks should have led to exploration of the right temporal lobe, the correct site of the lesion. The spinal cord symptoms of diffuse root pain, sensory changes, and ataxia of the legs combined with alterations of the reflexes from exaggeration with a Babinski sign to loss of reflexes are explainable by the growth of the tumor in the sub-arachnoid space and its variation of pressure at different levels of the cord.

The pathology is described in detail with illustrations of gross brain sections. Both macroscopically and microscopically the tumor showed the characteristics of a malignant glioma.

**Bayley de Castro, A.: A Cyst of Interest.** *Indian M. Gaz.*, 1921, lvi, 16.

The author reports a cyst which in its external appearance and its history resembled a sebaceous cyst except that its growth was rather rapid. It was situated over the right parietal bone. While it was being dissected out its sac burst; it was therefore treated as an ordinary incised abscess. On exploring the interior with his finger, the author discovered a very evenly punctured hole through the plates of the bone. The dura was visible. No connection between the dura and the sac of the cyst could be discovered. The cyst was about the size of a goose egg, and the duration of its growth was a little over three weeks.

The patient, a well-developed young man, had never suffered from headache or from localized pain in the cyst. He had never had a head injury and he gave a negative history for syphilis. His recovery was uneventful.

M. I. MALONEY.

**Beck, J. C., and Jesser, J.: Plastic Surgery of the Face.** *Internat. J. Orthodont. & Oral Surg.*, 1921, vii, 81.

The authors present cases, photographs, and casts illustrating the subject of plastic surgery of the face in civil practice.

Two types of plastic surgery are discussed: (1) cosmetic surgery such as that performed for the correction of hump nose, saddle nose, or a lateral deflection or twist; and (2) reconstructive surgery for the correction of defects due to pathologic changes or injury.

The first case reported was that of a young woman who had a beauty specialist inject a mass of paraffin into her nose. This injection was followed by a growth of tissue around the paraffin, causing the formation of a tumor or paraffinoma. The

tumor was painful, discolored the skin, and reached into the orbit, the cheek, and down over the lip. After excising it, the authors used radium (25 to 50 mg.) over the connective tissue to prevent further growth. Later a plastic operation will be performed.

The second case was a case of destruction of the nose by lues. The nose was rebuilt with tissue obtained from neighboring parts.

The third case was that of a man with true tuberculosis of the nose which necessitated its surgical removal and radium treatment. The tuberculosis was entirely cured and at the time the article was written reconstructive surgery was in progress.

The fourth case was interesting from the standpoint of etiology and the amount of surgical work which had been done. Thirty-three operations had been performed under general anesthesia. When a child, the boy had had some form of eczema or erythema and the family physician by mistake applied a corrosive substance which destroyed the greater part of the nose as well as the eyelids and lips.

The fifth case is reported to demonstrate the method used to reach a large tumor in the post-nasal space, a fibrosarcoma. This growth was removed by slitting the palate on one side of the uvula up to the hard palate.

In a case of cleft palate very good results were obtained from closing the bony perforation by suturing in place the posterior end of the inferior turbinate, the anterior end being left attached.

O. M. ROTT.

**Whitham, J. D.: Restoration of the Cheek and Temporal Region by Pedicled and Sliding Grafts of Skin and Muscle; Report of an Illustrative Case.** *J. Am. M. Ass.*, 1921, lxxvi, 448.

The treatment of cutaneous angiomas or "port-wine" birth-marks by the roentgen ray is not satisfactory, and the case reported by Whitham illustrates in an extreme degree how dangerous it may be.

The patient, a man aged 23 years with a negative family history, had had a "port-wine" birth-mark covering almost the entire right side of his face since birth. Nothing was ever done to remove this blemish until December, 1917. At that time he feared the condition would disqualify him for military service, and to insure his acceptance in the army he applied for treatment. His physician referred him to a roentgenologist.

The roentgenologist gave him about eighteen roentgen-ray exposures, each lasting from five to ten minutes. These were given in series of three consecutive days with rest periods between. About March 15, 1918, two weeks after the last roentgen-ray exposure, a blister began to form all over the birthmark. Later this ruptured and exuded serum. When the patient was inducted into the army, May 25, 1918, part of this blister had healed. A few days later, ulceration and sloughing began which at first affected the skin and soft tissues of the cheek and soon spread to the temporal region and deeper



structures. By September, the soft tissues of the cheek had sloughed off, leaving a large opening into the mouth and nose through the maxillary sinus.

By February, 1910, the right malar bone and a large part of the right superior maxilla were denuded and necrotic, the undestroyed portions of the right masseter and buccinator muscles were exposed, and there was an intense right orbital cellulitis.

On March 28, the right eye was enucleated and the right malar bone and a portion of the right superior maxilla were removed as sequestra.

By May 28, extensive destruction of the squamous portion of the temporal bone and overlying soft tissue was present. Sloughing tissue and necrotic bone were removed down to the inner plate of the temporal bone. The temporal region remained open, discharging foul-smelling pus for several months, but after the removal of several small sequestra, it began to granulate over so that by November, 1919, the bone and soft tissues were covered with epithelium except for an ulcerated patch about  $\frac{1}{2}$  in. square just below the outer angle of the orbit.

On Sept. 29, 1919, the patient had a typical attack of Jacksonian epilepsy involving the side of the body opposite the lesion.

By February 19, 1920, the wounds were clean and the patient was in good physical condition. On this date, under procaine anæsthesia, a skin lining for the outer wall of the maxillary sinus was made by turning together two flaps—one from the cheek below the opening and the other from the side of the nose. These were sutured with interrupted silk stitches. A large pear-shaped flap including tissues down to the pericranium was then cut with a thick pedicle from the right side of the forehead, including all the tissue between the eyebrows. This was brought down and sutured without tension over the turned-in flaps. Interrupted skin sutures were used. Small rubber tissue drains were placed in each lower angle of the wound. The wound healed quickly.

On April 5 the second operation was performed. This was designed to restore the soft tissues over the temporal region, to cover the exposed dura in this region with healthy skin and muscle, and to obtain a cosmetic result. When the wound was freshened it was noted that in several places the squamous plate was entirely lacking. Two horizontal incisions were made in the scalp, beginning above the right ear and extending back to the region of the external occipital protuberance. The incisions were  $2\frac{1}{2}$  in. apart. The flap thus outlined was cut to include the remnants of the temporal muscle, brought forward by sliding, and sutured into the defect with interrupted silkworm-gut stitches. The defect was thus covered with healthy scalp and a portion of the temporal muscle. The resulting scars were for the most part in the hairy portions of the scalp and therefore not conspicuous.

A month later the pedicle of the forehead flap was returned. At a future date still further improvement will be obtained by scar excision and skin grafting to correct the ectropion in the lower eyelid.

By May 1, 1920, the wound had healed. The patient had had no recurrence of convulsions, had gained 25 lb. in weight, and was in perfect health.

M. I. MALONEY.

## NECK

**Gilman, P. K.: Cysts and Fistulæ of the Thyroglossal Duct.** *Surg., Gynec. & Obst.*, 1921, xxxii, 141.

In this article Gilman reviews the embryology, anatomy, and pathology of the thyroglossal duct.

There are three lesions associated with the thyroglossal tract: first and most common, the development of cysts leading usually to the formation of fistulæ; second, the development of solid tumors; and third, the development of thyroid rests along the tract.

Thyroid gland tissue persists along the course of the thyroglossal tract especially when the development of the thyroid in its normal situation has been incomplete. These thyroid areas may develop at any point along the course taken by the original vesicle in its journey from the floor of the pharynx to the normal thyroid site. Aberrant thyroids have their origin in rests held up along the course and may present all the histologic characteristics of goiter. They are more frequent in women than in men.

Solid tumors associated with the thyroglossal tract include adenomatous and carcinomatous growths.

Cysts of the thyroglossal duct are lesions which commonly result from the persistence of the duct either in part or in whole. The essential structure of cysts of this type is very constant. The wall consists of consecutive layers of connective tissue with little or no inflammatory reaction. In larger cysts and those which have become infected, the fibrous wall may be thickened, dense, and compact with cellular infiltration. Blood vessels are usually numerous and course about the cyst between the layers of fibrous tissue.

Thyroglossal cysts form in the midline of the neck or tongue along the site of the original tract. In this they differ from the lesions of the branchial clefts which are lateral in their situation. The thyroglossal cyst is never congenital. It may appear at any time after birth from the earliest months to adult life.

The size to which thyroglossal cysts develop varies greatly and depends in part, at least, upon their location, the course taken in their development, and the absence of infection.

Persistent portions of the thyroglossal duct may remain quiescent for years and may be revealed by some acute inflammatory process with symptoms similar to those caused by an acute phlegmon or by a small swelling which increases steadily in size. Small cysts may give rise to no symptoms and at times are discovered only in the course of a routine examination.



If suppuration occurs and passes through the wall, suppurative exudate may burrow along the planes of the neck to almost any point. Suppuration of the thyroglossal duct presenting as an abscess above the sternum is at times misinterpreted and opened locally. A persistent sinus then results.

The treatment of cysts and sinuses of the thyroglossal duct is complete excision. A transverse collar incision made at the level best meeting the requirements gives good exposure when the flaps are dissected back above and below. A cyst should be freed as completely as possible by shelling it out. If a sinus is present, the opening should be freed with as much of the surrounding skin as possible and traction then employed to bring out the upper portion of the tract or sinus. The latter may then be followed by blunt dissection after separation of the neck muscles away from the median line.

The author reports 10 cases illustrating the various types of cysts and fistulae of the thyroglossal duct.

M. I. MALONEY.

**Williams, C.: Classification of Goiter: Analysis of One Hundred Cases.** *Am. J. M. Sc.*, 1921, clxi, 223.

Carrington presents a report of the last 100 cases of goiter operated on in St. Luke's Hospital, Richmond, Va., during a period of eighteen months. All cases admitted to the surgical service were operated on except 3. One of these was that of a woman, 55 years of age, with extensive myocardial and renal degeneration, who was treated with the roentgen ray and later died. The second was that of a man, 45 years of age, with thyroiditis following influenza which was associated with chronic and severe myocarditis and aortitis. The third was that of a woman, aged 47 years, who had a large, very hard goiter and bony metastasis in the lumbar spine. The diagnosis of carcinoma of the thyroid with spinal metastasis was made and the condition was considered hopeless. These 3 cases are not included in the series forming the basis of this paper. The cases were divided into three groups:

Group 1 included the cases of simple goiter regarding which there is little to be said. The symptoms were few, consisting chiefly of hoarseness, obstruction to breathing, and difficulty in swallowing due to pressure. The patient came to operation for the relief of these symptoms or, as was more frequent, for correction of the deformity. There were 61 patients in this group, 4 males and 57 females.

Group 2 was made up of cases of hyperthyroidism. Patients belonging to this group are middle-aged and have had a goiter for a long time without symptoms. These quiescent goiters suddenly begin to grow, and coincident with the growth the patients become restless and nervous and suffer attacks of palpitation, acceleration of the heart rate, and loss of weight. They do not have the fine tremor or the exophthalmos of the third group. In this group there were 20 patients, 1 male and 19 females.

Group 3 included cases with the classic symptoms of exophthalmic goiter. Besides the symptoms shown by the cases belonging to Group 2, fine tremor and exophthalmos are present. There were 19 patients in this group, all females.

As a result of this study the author concludes that all toxic goiters should be regarded as belonging to two definite groups: (1) those in which the intoxication is due to recent proliferation of the parenchyma in an old goiter (Group 2), and (2) those in which the thyroid hyperplasia is primary and probably associated with other pathology (Group 3).

The simple goiter of Group 1 should be surgically removed not only for the relief of the pressure and for cosmetic improvement, but also to remove the danger of hyperthyroidism and cancer which may develop as the patient and the goiter become older.

Patients belonging to Group 2 may be relieved by removing the goiter and may expect perfect recovery unless the operation is delayed until thyroid stimulation has seriously damaged other vital organs. If not treated, they will become progressively worse but will not develop exophthalmic goiter.

Patients in Group 3 are benefited by surgical treatment. The prognosis, however, is not comparable to that in the cases of Group 2. Williams believes that the best results claimed in cases of exophthalmic goiter have been due to operations on cases belonging to Group 2 which are not cases of exophthalmic goiter. The converse also is true—that is, that the poor results are obtained in cases which should be classified in Group 3. In spite of this, however, surgery is the best treatment now known for exophthalmic goiter.

The roentgen-ray and radium treatment of goiter should be confined to cases in Group 3, and it is possible that with further development the radiologist may be able to take precedence over the surgeon in the treatment of cases in this group.

G. W. HOCHREIN.

## SURGERY OF THE CHEST

### CHEST WALL AND BREAST

**Schupfer, F.: Pleurisy and Peritonitis in the Syphilitic (Pleuriti e peritoniti nei sifilitici).** *Riforma med.*, 1921, xxxvii, 25.

The author states that there are three types of syphilitic pleurisy, the congenital luetic type and

the types characteristic of the secondary and tertiary stages of syphilis. The last two may be either primary or secondary to specific lesions in the neighboring organs.

Schupfer describes the case of a man 32 years of age with pleurisy with fibrinous exudate on the left side, an exudative mass in the peritoneum, marked



enlargement of the spleen, and considerable enlargement of the liver, who showed signs of peritonitis. The disease had an acute onset. Sharp pain in the left shoulder which accompanied its inception might have been due to either the splenomegaly or the pleurisy. Besides a generalized polyadenitis, the patient had a definitely positive Wassermann reaction and under treatment with iodine and mercury his symptoms of pleurisy and peritonitis rapidly disappeared. Both the physical examination and subsequent observations showed the presence of tuberculosis in the right lung.

If this is to be considered a case of syphilitic pleurisy the author believes it belonged to the tertiary stage as the clinical features indicated that it should be included in the class of cases described by various authors as syphilitic serositis of the tertiary stage. The characteristics of this type are: (1) the presence of other specific lesions which show the same evolution and appear with, or shortly before, the pleurisy; (2) symptoms of general syphilitic infection; and (3) improvement following mercurial treatment.

The author discusses the case in detail and states that in his opinion it is not probable that pleurisy, and especially a primary pleurisy, may have a purely luetic origin. In many of the cases reported in the literature the patient was frankly tuberculous, and Schupfer is certain that in his own case the serositis was tubercular rather than syphilitic. However, as the condition was peculiar, he preferred to treat it as a case of polyserositis in a luetic subject. If a tubercular pleurisy or peritonitis develops in a syphilitic person it may reveal manifestations of a lues which up to then was latent, and the clinical syndrome is apt to be much more complex than in other cases. The reciprocal influence of the two diseases affects not only the clinical picture but also the evolution and prognosis, and the complex condition is variously influenced by the treatment adopted. If in dealing with pleurisy the clinician notes symptoms suggesting syphilis he must bear in mind the fact that tuberculous serositis is very much more frequent than luetic serositis in syphilitic persons and the clinical picture is different.

W. A. BRENNAN.

**Illum, F. M.: A Case of Adenoma of the Sweat Glands of the Axilla** (Ein Fall von Schweissdruesenadenom der Achselhoehle). *Hosp.-Tid.*, 1920, lxxiii, 697.

The patient was a woman of 34 who had several hard, oval tumors about 1 cm. long in both axillae. These growths seemed to involve the skin as it was not movable over them. The patient stated that similar tumors had been removed once previously. Those present when she was examined by the author had been growing for about a year. There was no local pain but complaint was made of radiating pain in the fingers. The tumors were removed and found on examination to be typical fibro-adenoma. The double layer of epithelium in

the gland elements, the marked membrana propria, and the situation of the tumors in the subcutaneous tissue indicated that they originated in the sudoriferous glands.

Aside from adenomata of the sweat glands the forms of tumor appearing in the axilla are: (1) follicular adenomata of the cutis (Kreibisch) which originate in the follicles of the skin and are made up of numerous gland structures with horny cells and a few rudimentary hairs; and (2) fibro-adenomata, which originate in an aberrant or accessory mammary anlage. Virchow doubted the existence of adenomata of the sweat glands, for the tumors which were so called and which he examined proved to be angiomata. Toeroek studied the cases reported in the literature and recognized only two as adenoma of the sweat glands. Pick reports two cases of adenoma of the sudoriferous glands of the vulva and discusses six cases in all. He states that to be classed as an adenoma of the sweat glands a tumor must show a membrana propria, a high, simple, cylindrical epithelium with a sharp border toward the lumen, and between the membrana propria and the cylindrical epithelium an ectodermal muscle-cell layer (Koelliker) whose mononuclear spindle-shaped cells lie with their long axes at an angle with the long axis of the cylindrical epithelium. The other tumors of the skin, which he calls "eruptive hidroadenoma" (Jacquet Darrier), "syringocystadenoma" (Toeroek), "syringoadenoma" (Unna), "syringocystoma" (Neumann), etc., do not correspond to this description for though they are connected with the excretory ducts of the normal sweat glands, they do not have any true gland lumen nor any membrana propria. Therefore, Pick suggests the name of "hidro-adenoid epithelioma" for all of them.

The genesis of hidro-adenomata is two-fold. Such tumors are either true adenomata arising from the sweat glands or hidro-adenoid adenomata arising from the surface epithelium and showing the characteristics of sweat glands. There are no morphological signs by which the two forms can be distinguished. Pick and others believe that possibly the hidro-adenoid adenoma is an adenoma originating from misplaced fetal sweat glands.

None of these tumors is found very frequently in the axilla. Most hidro-adenomata are formed in the vulva. Perthes discovered such an adenoma on the upper lip; Burthes saw one on the abdominal wall. According to Williamson, Schroeder, and Frattin, the tumors should be removed as soon as possible as carcinomatous degeneration has sometimes been observed. Landsteiner reports a case of recurrence two years after operation. The case reported by Illum was doubtless a recurrence even though no signs of malignancy were found in the growths. The author suggests that possibly there was a tumor of the spinal medulla, but does not state whether such a tumor would have any influence on the development of the adenomata.

SAXINGER (Z).



## TRACHEA AND LUNGS

**Lasker, W.: Echinococcus of the Lung** (Beitrag zur Kenntnis des Lungenechinokokkus). *Arch. f. klin. Chir.*, 1920, cxiv, 864.

After a brief discussion of the literature the author reports a case of large echinococcus cyst of the right lung observed in Bier's clinic. The disease had persisted for about thirteen years and though punctures had been made, the condition had not been diagnosed. Its true nature was finally revealed by punctures done outside the clinic, the weakly positive complement-fixation reaction, and the characteristic roentgen picture. The X-ray showed a shadow almost filling the right half of the breast, which had a very dark edge  $2\frac{1}{2}$  mm. broad, was convex upward, and exhibited a clear center with fluid.

After an opening as large as the hand was made in the thoracic wall where there was a visible prominence, and after the purulent contents had been removed, the tumor, which was as large as a child's head and surrounded by a calcified capsule was freed from numerous adhesions and removed.

In spite of a good general condition before the operation the patient died the next morning of what was regarded by the author as anaphylactic shock. While the thick cyst wall did not allow any absorption of the echinococcus fluid, as shown by the slightly positive result of the complement-fixation reaction, the body was sensitized by the previous punctures so that anaphylaxis was pro-

duced when it was flooded with cyst contents at the operation.

The diagnosis of lung echinococcus is made by finding the specific organisms in the sputum, by eosinophilia, the complement-fixation reaction, and the roentgen findings. Puncture is absolutely contra-indicated because, aside from anaphylaxis, it may cause death from empyema and pneumothorax.

SIEVERS (Z).

## MISCELLANEOUS

**Drey, L.: A Case of Traumatic Chylothorax Caused by a Shrapnel Bullet Free in the Pleural Space** (Ein Fall von Chylothorax traumaticus entstanden durch eine frei im Pleuraraum bewegliche Schrapnellkugel). *Monatschr. f. Unfallheilk.*, 1920, xxvii, 241.

Chylothorax is rare; only 24 cases are known. Its causes are various; as a rule its mechanism is easily explained. The condition generally occurs on the right side; it is very rare on the left side.

In the case reported the duct was not injured immediately but was traumatized later by the shrapnel bullet moving about freely in the pleural space. On account of the injury to the lung tissue chyle was coughed up.

Suppuration is rare in chylothorax. The effusion is intermittent. Observation and puncture give the diagnosis. The prognosis good; recovery always results. The treatment is merely symptomatic.

WEICHERT (Z).

## SURGERY OF THE ABDOMEN

## ABDOMINAL WALL AND PERITONEUM

**Wernoe, T. B.: Zones of Hyperaesthesia on the Abdomen** (Aesthesioskipoa abdominalis). *Ugesk. f. Læger*, 1920, lxxxii, 1415.

If a part of the warm skin is cooled it becomes pale. The nerve endings which perceive cold set up a spinal vasomotor reflex. Therefore, if any of these cold-perceiving nerves are hyperaesthetic, the reflex is increased; that is, the hyperaesthetic zone becomes colder than the surrounding skin. The variation is barely perceptible in full daylight, but if the patient is turned so that the part under examination is in the shadow a distinct difference between the hyperaesthetic zone and the surrounding skin will be noted. The paler area does not appear instantly but becomes evident after the few seconds necessary for the adaptation of the eye and for the stimulus to traverse the nerve tract.

The author uses ordinary room temperature as the necessary degree of cold. The advantage of this method of examination is that it is quicker, more accurate, and more definite. It is of value in localizing visceral lesions. In diseases of the gastrointestinal tract the hyperaesthesia is bilateral and symmetrical because every segment of the alimentary tract has bilateral innervation. For example,

in appendicitis and cholelithiasis the irritation does not extend merely along the spinal nerve tracts of the right side, but passes from there to the medulla where it is distributed to the cerebrospinal nerves of both sides. Cold and pain are felt only on one side apparently because of a functional anomaly in the spinal segment corresponding to the nerves involved, which is due evidently to a physiological anaesthesia of the brain, "a slumbering condition of the controlling brain centers which has developed gradually on account of the position of these organs on the right side of the abdomen."

These hyperaesthetic zones show characteristic figures in certain abdominal diseases: in cholelithiasis there is an equilateral triangle in the epigastrium; in ulcer of the duodenum, an almost equilateral rhombus in the epigastrium with its long axis vertical; in ulcer of the stomach a rhombus in the epigastrium with its long axis horizontal; in colitis, a rhombus below the umbilicus; in bladder diseases, an oval figure in the pubic region; in nephrolithiasis, a field showing horizontal strips in the lumbar region; in pyelitis, a triangle in the same region; in diseases of the uterus, prostate, and rectum, a rhombus in the sacral region. If the skin is pigmented or covered with hair the figures are not so easy to see.

SAXINGER (Z).



## GASTRO-INTESTINAL TRACT

**Lund, F. B., and Foley, J. A.: Hæmorrhage from the Stomach and Œsophagus.** *Boston M. & S. J.*, 1921, clxxxiv, 163.

Profuse vomiting of blood comes from a rupture of a varicose vein in the œsophagus, while the origin of diffuse hæmorrhage is one or more very superficial ulcerations, abrasions, or "weeping surfaces" in the stomach. Rupture of an œsophageal vein usually occurs in older patients and is attended by symptoms of more or less advanced cirrhosis of the liver.

Case 1 in this article is reported to illustrate the fact that cirrhosis of the liver may be the cause of fatal hæmorrhage from the stomach in a young adult without previous symptoms of cirrhosis of the liver. Case 2 demonstrates that hæmorrhage from a small ruptured vein in the œsophagus may be so slow as never to cause vomiting of blood until it has gone on long enough to produce fatal anæmia. The third important cause of hæmatemesis is erosion of a large blood vessel by deep chronic ulcers.

Operations on the stomach are contra-indicated in the presence of shock due to loss of blood. In acute cases the ulcer may heal while the stomach is kept at rest in the treatment of the first hæmorrhage so that the bleeding is never repeated. With regard to cases of chronic ulcer the dictum that operation is indicated after a second hæmorrhage has been generally accepted, but the second hæmorrhage may be fatal.

The use of an actual cautery in operations for ulcer has greatly simplified the treatment of hæmorrhage and made it much safer than before. Transfusion constitutes a ready means of changing the case from a poor to a good operative risk. The authors believe that immediate transfusion and cauterization of the ulcer are preferable to waiting, for if operation is delayed there is constant danger of repeated hæmorrhage followed by possibly fatal exhaustion.

E. C. ROBITSHEK.

**Perman, E.: The Nervous Apparatus of the Stomach and Ulcer of the Lesser Curvature.** *Acta chirurg. Scand.*, 1921, liii, 703.

The author describes the anatomy of the nervous system of the stomach and shows how the different nerves are affected by ulcers at different locations and why they are so affected. The nerves of the wall of the stomach contain no sensitive fibers and it is very probable that the ulcer pains may be due to a great extent to an irritation of the sensitive nerves in the small omentum. This is the theory of Kappis.

In some cases the ulcer pain may be produced by encroachment of the inflammatory process onto the sensitive parietal peritoneum or the stretching of the adhesions. It is probable also that the normal or increased gastric peristalsis may cause pain by pulling or dragging the nerves around the ulcer, the

irritability of which is greatly increased. The definitely localized pains which occur on palpation of the epigastrium above the ulcer are probably produced by mechanical irritation of the nerves lying close to the ulcer.

M. I. MALONEY.

**Poulton, E. P.: An Investigation of the Cause and Relief of Pain in Gastric Ulcer.** *Lancet*, 1921, cc, 263.

An important element in the pain of gastric ulcer is due to distention of the stomach. This may be relieved by reducing the intragastric pressure. In the author's investigation two methods were adopted:

1. A fine rubber tube, impregnated with lead at its lower end for X-ray localization, was passed into the stomach. Air or oxygen was then introduced through the tube from a reservoir connected with a water manometer. The patient was asked to describe his sensation, whether of fullness or pain, while his stomach was being distended.

2. A tube similar to that used in the first method was passed while the patient was experiencing pain.

In many cases the pain was relieved within a few minutes by release of the pressure.

The gastroduodenal tube is a modification of the gastric tube. It connects the stomach and duodenum so that pressure is equalized through the pylorus. It is about 2 ft. long and contains holes  $1\frac{1}{2}$  in. apart. Both ends are opaque to the X-rays and to one end a piece of silk 27 in. long is attached. The tube is passed into the stomach where it readily passes the pylorus. The upper end of the tube is anchored in the stomach 22 in. from the lip. After the stomach has been outlined with a little barium-sulphate suspension the position of the tube is easily determined. As the tube seldom lasts longer than two or three weeks, it should be removed once a week and examined.

It is not intended that a tube of this kind be used routinely in the treatment of peptic ulcer; its purpose is rather to secure evidence of the cause of the pain. The patients thus treated were for the most part out-patients and were doing their usual work. They were encouraged to take ordinary food; no drugs were recommended at first although later olive oil and petrolatum were given.

The normal sensation produced by air distension of the stomach is fullness. Following sudden marked distension, however, pain may be present until the stomach adjusts itself.

Sixteen patients with active ulceration were examined for pain produced by distension by this method. Fourteen patients experienced a feeling of fullness and the characteristic pain, which disappeared with release of the pressure. Of the two who did not feel pain, one was temporarily improving at the time of the observation, but later suffered a relapse. A positive result with this test does not necessarily indicate a gastric lesion, but a negative result may be of value in excluding such a condition.



Sixteen patients were studied with regard to the relief of pain on passage of the tube. Thirteen of these were relieved. Of the other three, two found the use of the tube very unpleasant and the statements of one were unreliable as new pains developed every two or three days in various parts of the body.

Is there any evidence that gastric pressure is responsible for the continuance of ulcer? Bolton found that the hydrochloric acid of the stomach was the cause of acute ulcer when gastrototoxic serum was used experimentally. This was prevented if the stomach contained alkali. By the artificial production of some degree of pyloric stenosis or by the use of a diet of meat instead of milk, the healing of an acute ulcer is prevented. Both of these factors lead to food retention and increased gastric pressure.

In some cases of gastric ulcer the free hydrochloric acid is low or entirely absent. Reference is made to a case of ulcer of the lesser curvature after gastrojejunostomy; gastric analysis showed no free hydrochloric acid. It is possible to explain the sudden relief from pain sometimes noted after gastrojejunostomy by the release of pressure. In the past, lavage has been done for the relief of pain. In some cases it has been discovered that the mere passage of the tube gives relief.

Gastric distension is an important element in the pain of gastric ulcer and can be relieved by gastric and gastroduodenal tubes. Some evidence has been offered that chronic gastric ulcer is due to intra-gastric pressure.

MERLE R. HOON.

**McKelvey, J. L.: Acute Perforation of Gastric and Duodenal Ulcer, With Notes of Twenty-Five Cases.** *Med. J. Australia*, 1921, i, 3.

To the patient the outstanding feature of acute perforation of a gastric or duodenal ulcer is pain while to the surgeon it is abdominal rigidity. The pulse may be excellent in rate and volume. Later, with increasing peritonitis, its rate increases. When it reaches 115 to 120 the condition is very serious. The pain of perforation in duodenal ulcer is felt generally to the right of the midline. Inasmuch as the duodenal contents may trickle around the right colic flexure and down the ascending colon to the cæcum, the cæcum may be bathed almost at the first with infective material, and pain and tenderness in this region may suggest acute appendicitis. A similar condition may arise in the rupture of a hydatid cyst of the right lobe of the liver when the contents gravitate to the cæcum. In the rupture of a gastric ulcer the pain is generally in the midline or to the left of it.

Rigidity is the outstanding sign. The upper abdominal muscles feel like a metal plate. Respiration is short and gasping. Tonic contraction of the muscles produces some retraction of the abdominal wall which gradually disappears with the advance of peritonitis. Free fluid may be detected in the flanks. Besides increasing in rate as the peritonitis develops, the pulse becomes small, hard, and wiry. Vomiting then begins. The tongue, which at first is moist, becomes dry, red, and fissured. The abdo-

men becomes distended and the area of tenderness spreads. Constipation is obstinate, and the facial expression becomes anxious. There is capillary stasis; the extremities become cold and clammy. The temperature varies but little. At first it is subnormal because of shock but later rises slightly as peritonitis develops. A high temperature suggests some other condition than perforation.

Among the conditions to be differentiated from perforated gastric and duodenal ulcer are: acute appendicitis, the most common condition; acute perforation of the gall-bladder; rupture of a hydatid cyst of the liver (this may be accompanied by great pain, shock, and rigidity; urticarial rash and increased liver dullness may suggest the condition); acute pancreatitis (rigidity not so marked); basal pneumonia with either costal or diaphragmatic pleurisy; lead colic; tabetic crisis; intestinal obstruction and mesenteric thrombosis (these lack the rigidity of perforation but the melena of thrombosis may suggest a bleeding duodenal ulcer); Addison's disease with abdominal pain; erosion of the head of the pancreas associated with duodenal ulcer (not associated with rigidity); embolism (rigidity is not so marked in this condition and the cardiac signs will suggest embolism); and hepatic, renal, and pancreatic colic which are characterized by restlessness.

When the abdomen is opened there may be some bubbling of gas but there is always free fluid which is generally yellowish or bile-stained and contains flakes of lymph and possibly food débris.

In perforation of the duodenum the fluid collects around the gall-bladder and duodenum, flows into the right kidney pouch, and down the outer side or along the ascending colon to the cæcum. From the cæcum it passes into the pelvic cavity. The pelvic cavity may contain much infective material while the small intestine area is still unsoiled. In some cases the fluid flows over the transverse colon and involves the area of the small intestine, but it is still directed to the cæcum by the obliquity of the mesentery and therefore to the pelvis. In both paths the appendix may be soiled.

In perforation of a gastric ulcer the anterior wall or lesser curvature is usually involved and the fluid may be limited by the transverse colon or overflow to the small intestine. Perforation of a pyloric ulcer resembles that of a duodenal ulcer. In duodenal perforation the fluid does not seem to enter the foramen epiploicum of Winslow.

The methods of dealing with the perforation vary in the practice of different surgeons and may be classified roughly thus: (1) simple suture with or without drainage, (2) suture with a patch of omentum, with or without drainage, (3) excision of the ulcer, (4) any of the methods mentioned with a gastrojejunostomy or other short-circuiting operation, and (5) simple drainage of the perforation by means of a tube, an "external duodenal fistula" being made.

The peritoneal cavity should be cleansed gently. The fluid should be mopped up with sponges, with



special attention to Morrison's kidney pouch. Washing out of the peritoneum is not necessary and is, perhaps, dangerous. The advisability of drainage is decided by the condition present within the abdomen. In the author's series there has been a decreasing tendency to drain. When the exudation is not shut off but is free among the coils of the intestines it cannot be adequately drained and must be dealt with by the peritoneum. The exudation formed may be a line of defense. A collection of pus in a cavity with walls made firm by lymph deposit needs draining because the walls do not collapse immediately after the pus is evacuated. When drainage was used in the cases reviewed it was established by rubber tubes without gauze.

After drainage the patient was put in the Fowler position and injections of saline solution were given by the rectum. Fluid, such as water, whey, barley water, or albumin water, was given by mouth as soon as the vomiting ceased. The diet was gradually increased by the addition of milk, broths, beef tea, junket, jelly, etc. On the seventh or eighth day fish or chicken was allowed. An alkaline mixture was given three times daily. The details of 25 cases are reported.

I. W. BACH.

**Menghetti, S.: Seven Hundred Cases of Gastric and Duodenal Ulcer** (Intorno a 700 casi di ulcera gastrica e duodenale). *Riforma med.*, 1921, xxxvii, 131.

Menghetti refers to 700 cases of gastric and duodenal ulcer observed and treated on Pauchet's service at Amiens and Paris. The mortality in cases of duodenal ulcer treated by Pauchet by simple gastro-enterostomy or gastro-enterostomy with cauterization was  $\frac{1}{2}$  per cent and in those treated by pyloric exclusion and pyloroplasty, between 2 and 3 per cent. The end-results show 90 to 95 per cent of definite and complete recoveries. In 3 or 4 per cent of the cases a secondary ulcer developed in the jejunum or the anastomosis when sutures other than catgut sutures were used. Jejunal ulcers which develop 1 or 2 cm. lower down in the jejunum—in its middle third—are due to the hyperacidity of the stomach rather than to the suturing.

In Pauchet's cases of gastric ulcer the mortality was 1 per cent in those treated by Balfour's operation or gastro-enterostomy and 5 per cent in those treated by gastrectomy. The end-results of gastrectomy, however, are perfect.

W. A. BRENNAN.

**Deaver, J. B., and Reimann, S. P.: The Surgical Treatment and the Pathology of Gastric and Duodenal Ulcer.** *Surg., Gynec. & Obst.*, 1921, xxxii, 103.

Deaver has repeatedly stated that in his opinion ulcers which cause early symptoms and are treated early, especially in the acute stage, may be healed by medical treatment. Few ulcers, however, cause early symptoms recognizable as such.

Excision remains the operation of choice in treating ulcers surgically, but it cannot always be the

chosen method as much depends upon the location of the ulcer, its size, the degree of involvement of the visceral coats, the extent of the induration, etc. Whenever possible, Deaver excises the ulcer with the knife or cautery.

When the ulcer has not impaired the mechanism and the motility of the stomach to any great extent, simple excision without a posterior gastro-enterostomy will suffice. From the standpoint of rationality and subsequent freedom from symptoms, gastro-enterostomy is indicated in all cases presenting marked hyperacidity before operation.

In a large percentage of cases ulcers at the pylorus demand pyloroplasty.

The authors describe the surgical treatment of ulcers on the lesser curvature near the pylorus, of large callous ulcers to the middle or to the left of the median line of the lesser curvature with extensive induration involving the walls of the stomach, and of ulcers on the anterior wall or posterior wall.

The operation of choice for duodenal ulcer in the first portion is pyloroplasty unless the ulcer is small, when excision will suffice.

The authors' pathologic study is based upon 143 specimens, 48 from the stomach and 95 from the duodenum, which were typical of those described in the literature.

Three points especially emphasized are the necessity for a careful analysis of the clinicopathologic findings and the importance of a very careful gross examination and judicious choice of several blocks of tissue for section to exclude carcinoma.

E. C. ROBITSHEK.

**Mayo, C. H.: The Surgical Treatment of Peptic Ulcer.** *Chicago M. Rec.*, 1921, xliii, 41.

Peptic ulcers occur in all races, in all climates, and apparently regardless of the type of food ingested. The roentgenographic and fluoroscopic findings, together with the history, symptoms, and gastric tests make an accurate diagnosis possible in the majority of cases. Peptic ulcers are found in males three times as often as in females. According to the records of the Mayo Clinic, which show that from January, 1906, to January, 1920, there were 1,101 operations for gastric ulcer and 4,532 operations for duodenal ulcer, the proportion of gastric to duodenal ulcer is about 1 to 4. In 203 cases of the series both gastric and duodenal ulcers were found in the same patient. During a five-year period 28 of 638 patients with gastric ulcer had multiple ulcers.

Peptic ulcer is not due to trauma in the sense of injury. Rosenow's work in which he caused the formation of definite gastric ulcers in animals by injecting into the circulation bacteria which were obtained from ulcers excised from human stomachs is most illuminating. Peptic ulcers occur only in the first part of the duodenum because the acid gastric contents passing into the duodenum are held above the common duct for neutralization in the area of Brunner's glands so that alkaline digestion may be carried on lower down. Secondary gastroduodenal



ulcers occur more frequently when permanent sutures are used.

Cannon has shown that the pylorus is held closed by acids; it may be said to be relaxed by alkalies. Gastro-enterostomy for the relief of ulcer lowers the general acidity and changes the chemical environment of the ulcer area. The new opening overcomes the effects of the pyloric spasm, and the alkalies are utilized at the proper time to lower the acidity. All ulcers of the duodenum which bleed should be destroyed or the vessels should be ligated.

When a gastro-enterostomy is performed the jejunum should not be reversed or twisted. The operation is done for obstruction or for ulcer; if one or the other of these conditions is not present, the patient is made worse by the procedure. If the operation is indicated, it should give quick and permanent relief. The Mayo Clinic mortality in uncomplicated cases is approximately 1.76 per cent.

Gastric ulcers may develop into cancers, but duodenal ulcers do not; hence the former should be destroyed by the cautery, the Balfour method, or excision.

The surgical treatment of ulcer of the stomach or duodenum is strongly urged as this method carries less risk than the disease, treated or untreated, and does away with the prolonged care which is necessary in medical treatment.

C. F. ANDREWS.

**Broders, A. C., and Mahle, A. E.: Primary Lymphosarcoma of the Stomach; A Report of Twelve Cases.** *J. Lab. & Clin. Med.*, 1921, vi, 249.

Primary lymphosarcoma of the stomach as compared with carcinoma of the stomach occurs in the proportion of 1 to 68 according to the records of the Mayo Clinic. Only a few cases are reported in the literature.

The authors report 12 cases observed at the Mayo Clinic from January, 1913, to December, 1920, with an average duration of symptoms of 6.08 months. Eleven patients gave a history of loss of weight; 9, of pain; 7, of vomiting; and 2, of bleeding; 2 had histories suggestive of previous ulcer. The average age of the patients was 46. The youngest patient was 16 and the oldest 62. Eleven were males.

In 7 cases the condition was diagnosed clinically as carcinoma; in 1, as ulcer; in 1, as abdominal tumor, probably inflammatory; in 1, as a lesion of the stomach, probably malignant; in 1, as pyloric obstruction; and in 1, as an upper abdominal tumor, probably of the pancreas.

Resection was performed in 6 cases and in the other 6 the condition was found to be inoperable on exploration. The neoplasms were located for the most part in the pyloric portion.

On section, the rolled-edge border of the neoplasm with its raised surface lying in the folds of the normal mucosa presents the appearance of a mushroom. The surface may or may not be ulcerated. On section, it is fairly soft and resilient and of a pale straw color; it is limited largely to the mucosa, but here

and there invades the musculature. In 1 case the growth appeared to extend directly through the muscle and serosa and into the gastrocolic omentum. The surrounding lymph nodes were also extensively involved.

On microscopic examination the tumor cells massed about the glands of the gastric mucosa are found to involve the entire space of the submucosa and to extend down between the muscle fibers. The cells largely resemble those of the germ center with areas of lymphocytes scattered here and there. The tissue is recognizedly lymphoid, but the absence of germ centers and the fact that with the exception of a few lymphocytes, the entire section is but a homogeneous structureless mass of cells, are particularly striking. In 2 of the 6 cases in which resection was done the lymph nodes were involved, and in 1 the serosa. In 4 of the 6 inoperable cases the adjacent lymph nodes were involved.

Two of the 6 patients who had resections died of peritonitis. One died four months after the operation with a recurrence in the lower bowel, the liver, and the remaining portion of the stomach. One returned five months after the operation weighing 20 lb. less and with a mass in the left epigastrium, probably a recurrence. Another returned in seven months with an apparent recurrence. One was operated on too recently to warrant conclusions. Four of the 6 patients whose condition was inoperable are dead; they lived from six weeks to four months after the exploration. Two patients have not been traced.

C. F. ANDREWS.

**Morris, J. N.: Primary Round-Celled Sarcoma of the Stomach.** *Med. J. Australia*, 1921, i, 66.

The relative incidence of sarcoma in malignant tumors of the stomach is variously reported as from 1 to 8 per cent, but because a microscopic examination was not made, cases of sarcoma have probably been erroneously reported as carcinoma.

Round-celled and spindle-celled forms of sarcoma predominate. The round-celled variety appears as a dense diffuse infiltration of the stomach wall projecting into the lumen and usually situated near the pylorus and along the greater curvature. It does not cause stenosis, but because of infiltration, it renders the stomach wall rigid and the pylorus patulous and interferes with the expulsive power of the antrum. The growth may invade the esophagus and duodenum. Usually it is nodular but it can rarely be palpated. It is smaller, of more rapid growth, and shorter course than the spindle-celled variety and forms metastases earlier.

The spindle-celled variety is less common than the round-celled variety. The growth is usually pedunculated and may become very large, forming a hard, movable polypoid mass. This may fill the greater part of the abdominal cavity and may be mistaken for some other abdominal condition.

In both types of sarcoma metastases may be found in the peritoneum, spleen, liver, lungs, or subcutaneous tissue, but occur later than in carcinoma.



The symptoms are indefinite, but in the majority of the cases digestive disturbances are noted. Pain is the most constant symptom. Nausea and vomiting may be present but are not frequent. In about 10 per cent of the cases vomiting occurs as a late symptom. Hemorrhage is rare in cases of the round-celled type, but occurs in 50 per cent of those of the spindle-celled variety. Anæmia is not frequent. There may be considerable loss of weight but this is not a constant symptom. Gastric analyses are similar to those in cases of carcinoma. The disease is more common in women.

The average age of incidence is 41.6 years. The diagnosis is generally based on the microscopic examination. Many reported cases were discovered postmortem. The prognosis varies with the duration of the disease prior to operation and the character of the tumor. The average length of life after operation is twenty-eight months in cases of spindle-celled sarcoma and fifteen months in cases of the round-celled sarcoma. One case is reported.

I. W. BACH.

**Boit, H.: The Treatment of Ileus** (Zur Behandlung des Ileus). *Arch. f. klin. Chir.*, 1920, cxiii, 921.

Boit emphasizes the necessity for thorough evacuation in ileus. Evacuation effected by means of puncture, opening of the loop of distended bowel, or massage of the bowel with the finger or the Dahlgren instrument is insufficient because only neighboring loops are evacuated. The Klapp suction method is satisfactory but requires several punctures of the bowel.

In the surgical clinic at Koenigsberg the Moynihan tube has proved itself of value. This tube is introduced into the intestine through the incision wound and the bowel is stripped over it as far as the duodenojejunal flexure and downward to the ascending and transverse colon. The outer end of the tube is then attached to a suction apparatus similar to the Pratt apparatus with the Bunsen bottle aspirator. Five-liter flasks are employed. As it was found that the thick fecal material frequently obstructed the tube, a larger tube with a diameter of 20 mm. was substituted for the tube used at first. This tube, which is 55 cm. long, is curved so that too great tension on the mesentery will be prevented when the last part of the small bowel is drawn over it.

The portion of the bowel opened for the introduction of the tube is walled off from the rest of the peritoneal cavity by the surgeon's assistant. The operator himself manages the introduction of the tube after the bowel loop has been massaged empty and clamped off. As soon as the clamp is removed the suction must be begun. The first assistant leads the tube through the bowel. If the wall is sucked into the tube the negative pressure in the tube must be lessened. When the upper bowel has been completely emptied in this manner the tube is withdrawn and directed downward, in some cases being inserted to the end of the colon.

In this manner the entire bowel may be emptied. In low obstruction in which it is necessary to empty the entire bowel the opening is made in the lower portion of the ileum. Mechanical injury of the bowel by this method has not been observed. Peristalsis usually sets in shortly after the evacuation. Immediately afterward the bowel has a bright red color.

Evacuation by the method described must be considered a major procedure but when the patient is unable to withstand it the case is hopeless.

HAGEMANN (Z).

**Flesch-Thebesius, M.: The Indication for Operation in Ileus** (Zur operativen Indikationsstellung beim Ileus). *Zentralbl. f. Chir.*, 1920, xlvii, 1562.

Autointoxication in ileus is proved by positive results in the two following tests:

1. The double ring test. In Heller's test, a white, clearly defined ring is formed just above the boundary line between the nitric acid and the urine and an albumin ring at the point where the two fluids touch.

2. Animal experiment. If 1.5 c.cm. of the urine in a positive case is injected intraperitoneally into mice, the animals die after an hour or two, sometimes after ten to twenty minutes. Normal urine used in the same way does not injure the animals.

If both tests are negative, it proves that there is no intoxication and therefore no immediate danger. If only the ring test is positive it means that there is beginning intoxication; if both are positive a pronounced condition of intoxication is indicated.

WEHL (Z).

**Neuberger, H.: Intermittent Ileus Due to a Murphy Button Thirteen and One-Half Years After Operation** (Durch Murphy-Knopf bedingter intermittierender Ileus, 13½ Jahre nach der Operation). *Wien. klin. Wchnschr.*, 1920, xxxiii, 984.

The patient was a man 56 years old who had an intermittent obstruction. For about six months this condition had been becoming more severe. The X-ray showed in the lower part of the abdomen on the left side a metallic foreign body the shape of a Murphy button. This was removed by operation. It lay in a diverticulum of the transverse colon near the splenic flexure. The button had been used in an operation performed thirteen and one-half years previously for the removal of a tumor of the colon.

KONJETZNY (Z).

**Ingebrigtsen, R.: Entero-Anastomosis in the Treatment of Acute Intestinal Occlusion** (De l'entéro-anastomose dans le traitement de l'occlusion intestinale aiguë). *Acta chirurg. Scand.*, 1921, liii, 105.

The author deals only with acute intestinal occlusion due to adhesions. It is dangerous to attempt to treat such a condition by removing the adhesions unless their removal is easy and can be effected under the most favorable conditions. The best method of treatment is entero-anastomosis.



The author has treated 7 cases by this method with 6 recoveries and only 1 death.

If the adhesions are easily accessible and can be easily detached without compromising the integrity of the intestinal wall this treatment is the simplest and most efficacious. If the intestinal wall is lacerated it must be resected. General detachment operations are usually not easy. The extensive adhesions following appendicitis are extremely difficult to detach and the danger of infection is great. In such cases the adhesions must be respected, a lateral entero-anastomosis being made outside them between a loop of small intestine and a collapsed loop as near the adhesions as possible. This method applied after a trocar puncture of the swollen loop overcomes the occlusion.

The author's cases were operated upon from three and one-half months to one and one-half years ago. Most of the patients have since been in excellent health. The excluded intestinal loop becomes deflated and relatively immobile, local circulation is facilitated, and inflammatory products are resorbed. There is no danger that the function of the excluded intestinal loop will be reduced.

W. A. BRENNAN.

**Bircher, E.: Enterostomy** (Die Enterostomie). *Schweiz. Rundschau f. Med.*, 1920, xx, 937.

Among 1,600 cases of appendicitis in the author's surgical section in recent years an enterostomy was necessary in 20. In Bircher's opinion the indications for this operation are broader than is generally believed; often no time should be lost in performing it.

It should be used in cases of localized paralysis of the intestine; in general paralysis of the intestine the results are less satisfactory. Postoperative ileus following appendectomy or almost any other operation may furnish an indication. It may be indicated also in cases not previously operated upon, such as cases of incarcerated hernia, ileus of unknown cause, volvulus, and ileus due to ascarides.

The author usually chooses the most distended loop of intestine and sutures it to the right rectus (always under local anæsthesia). He then opens the intestine, inserts a trocar, and applies a dressing. The trocar is left in place about two days.

In 60 per cent of the cases there is spontaneous healing of the fistula, but if it does not heal it is closed by operation under local anæsthesia.

GLASS (Z).

**Horsley, J. S.: Ulcer of the Jejunum Following Gastro-Enterostomy.** *J. Am. M. Ass.*, 1921, lxxvi, 354.

Ulcer of the jejunum following gastro-enterostomy is caused by the gastro-enterostomy. A jejunal ulcer is rarely found except after gastro-enterostomy, but may occur after diseases which destroy the efficiency of the pyloric portion of the stomach or interfere with the normal character of the gastric or duodenal secretion. It has been known to occur also without any previous operation.

It seems probable that the theory ascribing the ulcer to the entrance of the acid gastric juice into the jejunum is correct. There is no viscus of the body in which we can permanently alter the physiology by changing from a strongly alkaline to an acid medium, or vice versa, without causing derangement of function. If the acidity of the gastric juice is greatly lowered, symptoms are usually produced even though the reaction is not changed to alkalinity.

Balfour says, "The best results after gastro-enterostomy occur when there is stenosis of the pylorus." This clinical observation can be explained by the fact that in cicatricial stenosis of the pylorus no gastric juice enters the duodenum through the pylorus, the stomach contents being emptied entirely through the gastro-enterostomy stoma. Before the gastro-enterostomy is performed the powerful contractions of the stomach force a meager amount of gastric contents through the stenosed pylorus, but after the gastro-enterostomy the stomach is able to empty itself easily without such strong contractions. Consequently, the stenosis becomes complete when the pylorus is not subjected to the pressure of strong peristalsis. Such pressure is impossible when there is a leak at the gastro-enterostomy opening. Complete stenosis prevents the lowering of the alkalinity of the duodenal contents by the passage of gastric juice through the pylorus, and therefore the duodenal secretion is delivered at the stoma of the gastro-enterostomy with its maximum alkalinity. It then readily neutralizes the acidity of the gastric juice and protects the jejunum against the deleterious effects of the acid.

The frequency of ulcers in the pyloric end of the stomach and in the adjacent duodenum has not been fully explained, though many theories have been advanced. Undoubtedly the chief cause of ulcers of the stomach and duodenum is sepsis, which probably comes, as Rosenow has so frequently demonstrated, from hæmatogenous infection due to streptococci. It is probable also that at the time of the origin of the ulcer the hæmatogenous infection produces irritation or inflammation in the gall-bladder, appendix, pancreas, kidneys, and other organs.

In ulcer of the jejunum the etiology appears to be different. The lesser causes of jejunal ulcer are too greatly emphasized. Non-absorbable sutures undoubtedly predispose to ulceration at the site of a gastro-enterostomy. The use of clamps and any unusual trauma, the turning in of too much tissue, and interference with the blood supply are all direct causes of jejunal ulcer. Even when these factors are eliminated, however, jejunal ulcer follows gastro-enterostomy, though in a smaller proportion of cases.

A jejunal ulcer often forms around the margin of the gastro-enterostomy opening. This probably is due to the fact that the mucosa of the jejunum nearest this opening is least protected against the effects of the gastric juice. Its resistance, therefore, is lower.



The ulceration may occur where the current of gastric juice strikes the wall of the jejunum opposite the stoma. The author reports a case of this kind.

If the physiology of the jejunum is upset by gastro-enterostomy, why is gastro-enterostomy generally considered a satisfactory operation in cases of duodenal or gastric ulcer? The answer is that there is a distinct field for gastro-enterostomy, first, when, in the absence of hæmorrhage, there is cicatricial stenosis of the pylorus and duodenum so marked that the duodenum cannot be restored to normal; second, when there is a subacute perforation of the duodenum with such extensive leucocytic infiltration that its walls will not hold sutures and stenosis is almost certain to occur; and third, when there is obstruction of the pylorus due to inoperable malignant growths.

In most of the other cases, whether the ulcer is located in the body of the stomach or elsewhere, and when pyloric stenosis is confined to a narrow band of tissue, pyloroplasty is indicated.

Some time ago the author described a new method of pyloroplasty. Since then he has made some improvements in the technique. Instead of a single suture approximating the two ends of the incision, a second suture is placed not more than  $\frac{1}{2}$  in. above the first. These two sutures, when tied at the same time and held up, bring the anterior wall of the pylorus away from the posterior wall and at the same time make closure of the wound in the duodenum easier than when only one suture is placed or the second suture is placed farther up. The second change in technique is that the second row of sutures is used merely to approximate the cut edges of the peritoneal and muscular coats. Formerly an effort was made to invert the tissue with this row. When this was done the third row of sutures, which also inverted tissue, made too much of a lump. By merely approximating the cut edges with the second row of sutures and inverting the tissues with the third row, only a little of the edge of the incision is turned in and a smoother wound results. A mattress suture of fine tanned catgut is placed at the point of greatest tension after the three rows have been inserted, and with the long ends of this the omentum is brought up over the suture line.

Horsley has performed 24 of these pyloroplasties since the first one in April, 1918. During this time he has performed 4 gastro-enterostomies, 1 Judd operation for duodenal ulcer  $1\frac{1}{2}$  in. from the pylorus, and 2 pylorectomies. There were no deaths in the last 12 cases. G. W. HOCHREIN.

**Denk, W.: The Etiology and Prophylaxis of Post-operative Jejunal Ulcer** (Ueber Aetiologie und Prophylaxe des postoperativen Jejunalgeschwüres). *Wien. klin. Wchnschr.*, 1921, xxxiv, 2.

Postoperative jejunal ulcer occurs chiefly in men, probably because of the effect of tobacco on the nervous system. It is particularly apt to appear after duodenal ulcers which cause stenosis. It may occur in the suture line of persistent silk sutures,

and is favored by the irritation of solid food passed down prematurely. It may be produced also by the use of intestinal clamps.

Animal experiments have shown that injuries of the mucous membrane may lead to ulcers, but do not necessarily have this result. That chemical injury by the acid gastric juice is responsible is not very probable as ulcers have been observed even when the acid values were subnormal; moreover the small area of the ulcer as compared with the large area of intestinal mucous membrane over which the same gastric juice flows constitutes an argument against this theory.

Recovery may occur after perforation of the ulcer into the large intestine. Stagnation in the region of the ulcer probably keeps up the ulceration. Ulcers may arise even when the pylorus is resected. The most important factor seems to be primary injury of the mucous membrane. The safest prophylaxis is Billroth's No. 1 operation or extensive resection of the stomach. SCHUBERT (Z).

**Lehmann, H.: Inflammation of Meckel's Diverticulum** (Zur Kenntnis der Entzündung des Diverticulum Meckelii). *Wien. klin. Wchnschr.*, 1920, xxxiii, 884.

Perforating inflammations of Meckel's diverticulum are rare. Like enterogenous appendicitis, they generally arise when there is some predisposing factor which tends to narrow the lumen. It is difficult to distinguish the condition from appendicitis; sometimes the two diseases are associated.

A woman of 39 suddenly had severe abdominal pain. The abdomen was sensitive to pressure, especially on the left side and over the bladder. A diagnosis of appendicitis was made and an operation was performed. Diffuse peritonitis originating from an inflamed Meckel's diverticulum was found. Sixty centimeters of the ileum containing the diverticulum was resected. The patient recovered.

The diverticulum originated in the anterior wall of the intestine near the insertion of the mesentery and lay close to the mesentery. In the middle an angular kink was formed by constriction. The peripheral portion was distended and showed severe inflammatory changes. A cord-like structure which was adherent to the root of the mesentery passed out from its tip. Microscopically the diverticulum showed the structure of the intestinal wall. The musculature of the wall next to the mesentery was very thin while that of the free wall was of normal thickness. The peripheral part showed phlegmonous infiltration; the mucous membrane had disappeared except for two small remnants, one of which contained a Brunner gland.

The inequality in the strength of the muscles on the free and adherent sides caused curving and kinking of the diverticulum when the muscles contracted. This resulted in narrowing of the lumen which was still further increased by folds in the mucous membrane. The consequent retention resulted in inflammation. KOENIG (Z).



**Silvan, C.: Volvulus of the Cæcum Due to Constricting Membranous Pericolicitis** (Volvolo del cieco de pericolite membranose stenosante). *Riforma med.*, 1921, xxxvii, 104.

The author reports and discusses the clinical history of a man aged 59 years who came to the hospital with the diagnosis of peritonitis with probable gastric perforation. At operation the cæcum was found to be enormously enlarged and distended, globular in form, and about the size of a boy's head. Its lower pole was turned upward so that it occupied the umbilical and part of the epigastric regions. There were no adhesions but the organ was twisted twice on its longitudinal axis from right to left. It was easily untwisted and placed in its proper position in the iliac fossa; at the level of the ileocæcal valve a defect in the mesentery was found. The ascending colon was in its normal position but empty and fixed and constricted about its origin by a thick membranous band about the width of four fingers which originated in the peritoneum of the posterolateral abdominal walls. When the colon was freed from the investing membrane its permeability was at once re-established.

This case is of interest because of the fact that there was double torsion of the cæcum due to membranous pericolicitis and because of the stenosis. The mechanism of the complication may be explained by the anomalous condition of the cæcum which, being congenitally mobile, became gradually distended following the stenosis of the initial portion of the colon. Because of the increased difficulty in the passage of the fæces the stasis and distention were increased. Both this condition and the absence of an ileocæcal mesentery resulted in the volvulus.

The absence of important alterations in the circulation and nutrition of the cæcal walls notwithstanding the double torsion is also a point worthy of special notice.

After the removal of the pericolic membrane the membranous area was treated with camphorated oil to prevent the formation of new adhesions. In the author's opinion the pericolic membrane was of inflammatory origin.

Silvan concludes that this case is a contribution to our knowledge regarding membranous pericolicitis, not only because it supports the theory attributing the origin of the lesions to inflammation, but also because it demonstrates the possibility of late and uncommon complications such as cæcal stenosis and cæcal volvulus. The syndrome suggesting an acute gastric affection was due no doubt to the displacement of the distended cæcum in the upper part of the abdomen.

W. A. BRENNAN.

**Caucci, A.: Transplanting the Ileocæcal Valve** (Il trapianto della valvola ileo-cecale). *Polidlin.*, Roma, 1921, xxviii, sez. prat., 186.

The author reports the first results of experiments made on dogs in which he attempted to effect an end-to-side implantation of the ileum into the colon with preservation of the ileocæcal valve. He excised

a 5 mm. cuff from the cæcum near the ileum, resected the cæcum, and closed the end of the colon. He then made an end-to-side implantation of the extremity of the ileum into the descending colon, suturing on the cuff.

The results were controlled by rectal injections of water under pressure and by the X-ray. In 5 surviving animals it was found that the transplanted ileocæcal valve preserved its continence even under considerable pressure. In the cadaver the continence was less. In the first weeks there was often paralysis of the valvular sphincter. Section of the small intestine and of the mesentery a little above the termination of the colon produced valvular incontinence. The experiments are being continued.

W. A. BRENNAN.

**Rosenberg, M.: Incarceration of the Non-Inflamed Appendix** (Ueber Incarceration des nicht entzündeten Wurmfortsatzes). *Deutsche med. Wchnschr.*, 1920, xli, 1360.

The author reports two cases of incarceration of the appendix, one caused by a fall, the other by asthmatic attacks of coughing. Both patients had had a rupture for years but had never experienced any serious trouble from it. Therefore it is to be presumed that the incarceration was due to this condition rather than to inflammation of the appendix.

The author agrees with Koertes that a healthy appendix may become incarcerated and then may become gangrenous solely as a result of incarceration. In the first case reported an operation was performed at once. The appendix, bluish-red in color, was found incarcerated in the hernial sac just below its middle point. As soon as the ring was cut, it was easily drawn out and excised.

In the second case reposition was made two days before the operation, but the patient complained of pain in the abdomen and nausea and began to vomit. There was resistance above the right inguinal ring, and in the inguinal region there was an irreducible tumor almost as large as a hen's egg. After the ring was cut, the appendix, which was bluish black and showed necrosis at the tip, was drawn out and removed.

Though in both these cases the appendix was removed, Rosenberg disagrees with Moser and Gelpke who have stated that the appendix should be removed at every operation for right inguinal hernia. While a skilled surgeon can remove the appendix through an incision for hernia, even when the anatomical conditions are complicated, to do so it is necessary to operate in the dark, which is not according to good surgical principles. Such difficulties may be met that it may be necessary to give the operation up; old encapsulated abscesses may be ruptured or there may be firm adhesions. Rosenberg does not advise looking for the appendix after opening a right inguinal hernial sac, but believes that it should be removed when it lies in the sac.

WOHLEMER (Z).



**Gerlach, P.: The Difference Between True Carcinoma of the Appendix and the So-called "Carcinoids" of the Appendix** (Ueber die Abgrenzung der echten Carcinome des Wurmfortsatzes von den sogenannten "Carcinoiden" oder "kleinen Appendixcarcinomen"). *Frankfurt. Ztschr. f. Path.*, 1920, xxiv, 515.

Gerlach warns against the assumption that all epithelial new-growths of the appendix are carcinomata, stating that they may be classified as true carcinomata and "choristomata." The former are rare, show all the characteristics of an ordinary intestinal cancer, including destructive infiltrating growth with the formation of metastases and recurrence, and are found only at the age when carcinoma is prevalent.

The choristomata, formerly and less appropriately called "carcinoids," are benign, occur as a rule in young persons, never exceed a certain size, never show metastases or recurrences, and in their histological structure are different from true carcinomata which probably originate from displaced embryonic fragments. Choristomata of the appendix are not early stages of true carcinoma.

Gerlach does not state whether choristomata are due to a previous recurrent inflammation or are to be regarded as the cause of attacks of appendicitis.

Brief reports of three cases, one of true carcinoma and two of choristomata, are given. HARMS (Z).

**Lockhart-Mummery, J. P.: The Operative Treatment of Prolapse (Procidentia) of the Rectum in Adults.** *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Sect. Surg., 72.

The operation described in this article is performed as follows:

The rectum and the skin of the perineum and buttocks are first cleansed thoroughly with ether soap and lysol solution and then with 75 per cent alcohol and picric acid. The prolapse having been returned, gauze is placed in the rectum to prevent leakage during the operation. A transverse incision about  $2\frac{1}{2}$  in. long is made midway between the tip of the coccyx and the posterior margin of the anus and is deepened until the connective tissue between the rectum and the sacrum is opened. By blunt dissection or with the gloved fingers this space is opened as high up as possible and laterally until the rectum has been freed thoroughly at the back and sides.

The whole space thus opened is then lightly packed with sterilized vaseline gauze tape. This tape is 2 in. wide and has a sewed edge which prevents fraying. A very considerable amount of it is used, but the object is to get it as flat as possible in order to block the rectum, not merely to fill the pelvis with it. In some cases as much as 40 yd. has been used. The end of the gauze is left protruding from the wound and if more than one piece is used (as is usually the case) all the ends are firmly tied together at the finish.

The next step is the restoration of the anus. The choice of operation for this purpose must depend

upon the condition to be dealt with. The author usually extends the ends of the first incision forward on each side to about half way between the anterior and posterior margins of the anal orifice. The flap thus formed is dissected up so as to expose the posterior half of the external sphincter. This muscle is then carefully defined and the lateral portions are sewed together from behind forward until the anal orifice is narrowed to the extent considered desirable.

No. 1 catgut is used for the stitches; it is not pulled tight enough to cut through the muscle fibers, but just to bring the sides of the sphincter into close contact. Supporting sutures are then put in, and the flap is loosely stitched back in position, room being left for the removal of the gauze packing later. A short tube is placed in the rectum to prevent prolapse in case the patient strains on coming out of the influence of the anæsthetic, and the whole perineum is covered with sterilized dressings.

The wound is dressed twice daily with fresh dressings, but the packing is not removed for a week. At the end of this time an anæsthetic is given, all packing is removed, and a fresh lot of gauze is introduced. This is again left in for five days or a week. On its removal no fresh gauze is introduced, but a drainage tube is placed in the cavity which remains.

The wound is not allowed to heal under three weeks; in fact, the more slowly it heals the better the result. The bowels are kept confined until the seventh day after operation, when they are relieved by an enema before the removal of the packing. After this they are opened daily with an enema, a slipper bedpan being used.

The patient is not allowed out of bed for six weeks, and is not permitted to sit up for an action of the bowels for at least two months.

Because of the large area of cellular tissue opened up it is most important that there should be no sepsis at the time of the operation. Sepsis is almost certain to occur later after the removal of the packing, but is then desirable as the more slowly the wound heals and the greater the amount of fibrous tissue involved, the better the result.

E. C. ROBITSHEK.

**Smith, R. R.: Carcinoma of the Rectum and Sigmoid.** *J. Michigan State M. Soc.*, 1921, xx, 1.

In spite of the fact that the surgical treatment of carcinoma of the lower bowel has been elaborated to a high degree of perfection and offers today excellent results when the disease is recognized early, patients with this condition are coming to the surgeon but little earlier than ten years ago.

In the author's experience the failure of the practitioner to act promptly has been due, first, to a lack of knowledge regarding the early symptoms, and second, to his hesitancy to make rectal examinations.

It is well to bear in mind that carcinoma of the rectum itself rarely produces obstruction, even in



the early stages, whereas obstruction is usually an early symptom when a cancer is situated higher up. Bleeding is usually the first evidence of the disease, but since it is a common sign of hæmorrhoids, its significance is often misinterpreted.

In carcinoma of the sigmoid (or rectosigmoid) the earliest symptom is usually obstruction. It is surprising how much the lumen of the gut is sometimes narrowed before pain or other disturbance of function is produced. Slight cramp-like pain in the abdomen occurring constantly or frequently should call for an examination. An interesting symptom is diarrhoea, occurring especially in the morning.

If the growth is at the anal opening and lower than the internal sphincter—a condition which is comparatively rare—the removal of the lower end of the rectum with the adjacent skin and the inguinal glands on both sides is the operation of choice. If the growth is well within the rectum but still limited to the lower 3 in., the removal of all the rectum is indicated, the lower end of the sigmoid being brought to the end of the sacrum.

When the growth is at the rectosigmoidal juncture the preservation of the lower end of the rectum with the natural anus is allowable and a choice may be made from a number of procedures. It may be approached from above and, after an examination to discover metastases in the abdomen, the surgeon may proceed to free the lower sigmoid with the growth from its peritoneal attachments. He then may remove it well below the growth and, after inserting a large tube in the proximal end of the gut and passing it out through the anus, make an anastomosis of the ends.

When the growth is well up in the sigmoid and it can be freed and brought through the incision, an ideal procedure as far as safety is concerned consists in uniting the upper and lower limbs of the gut by suture, closing the abdomen so that the growth protrudes from it and removing the growth with the scissors in a week or ten days. Long forceps are then passed into the bowel, one blade in either limb, and clamped.

H. A. MCKNIGHT.

**Miles, W. E.: How Soon Should Colostomy be Performed in Cases of Cancer of the Rectum Which Are Inoperable?** *Proc. Roy. Soc. Med.*, Lond., 1921, xiv, Sect. Surg., 66.

During the progress of carcinoma at the recto-sigmoid juncture it is not possible to predict when the complications may arise. Therefore the author believes it is much the safer plan to perform a colostomy as a preventive measure at the earliest possible moment.

When the growth is situated in the ampulla of the rectum colostomy should not be postponed until the signs of obstruction are impending. Radium and diathermy should not be employed in the rectum until the flow of feces over the surface to be acted upon has been diverted by means of a preliminary colostomy.

When the growth involves the anal canal, colostomy gives complete relief, especially if it is combined with linear proctotomy.

The method which the author has found most successful in the creation of a spur consists in passing a stout silk ligature so as to include the whole width of the mesentery of the protruded loop and anchoring it to the skin on the mesial aspect of the wound.

E. C. ROBITSHEK.

**Lyth, J. C.: The Cure of Hæmorrhoids without Operation.** *Brit. M. J.*, 1921, i, 265.

The author makes no distinction between internal and external hæmorrhoids. He states that the potential number of hæmorrhoids is eight but this number is rarely seen. The critical period is when a pile is passing from the inside to the outside of the anus. As long as it is inside it does little harm. When it comes out permanently, it may produce pain, hæmorrhage, and irritation, and is liable to thrombosis and suppuration.

Operation is not always successful. As a rule the external hæmorrhoids and the more prominent of those which are internal are removed. If they do not recur this fact is probably due to the advice given the patient by the surgeon at the time of the operation reinforced by the expense, trouble, and pain of the operation.

Hæmorrhoids can be cured or rather made innocuous by changing the turgid mucus-covered and tender varix into a skin-covered excrescence and preventing the prolapse of other hæmorrhoids. This may be accomplished by inducing bowel movement at the time of retirement, preventing loose actions by careful and discreet use of aperients, and applying calamine powder on a sanitary wool gauze pad held in place by tapes tied around the waist. The pad should be changed in the morning. If calamine causes discomfort during the day, hamamelis or other ointment may be substituted.

After two or three weeks the hæmorrhoids will be sufficiently dried, shrunken, and painless so that the daily pad may be dispensed with. In a period of similar length the nocturnal pad may be omitted. The patient should continue to have a bowel movement at night, and calamine and a pad should always be available in case of further trouble.

Operation is usually unnecessary and rarely justifiable since the alternative suggested is inexpensive, without danger, and usually successful.

M. R. HOON.

#### LIVER, GALL-BLADDER, PANCREAS, AND SPLEEN

**Martens, E.: The Roentgen Study of the Arteries of the Liver** (Roentgenologische Studien zur arteriellen Gefaessversorgung in der Leber). *Arch. f. klin. Chir.*, 1920, cxiv, 1001.

For the roentgen demonstration of the arterial supply of the liver Martens laid the vessels bare and injected the contrast solution into one of the



arteries. This solution consisted of a 5 per cent collargol solution with 15 gm. of bismuth subcarbonate added to every 250 c.cm. His interesting experiments led to the following findings:

In a certain percentage of cases the branches of the hepatic artery are to be regarded as functional end arteries. Under all circumstances fine anastomoses between the two arteries of the liver are formed between the terminal branches within the liver or through the arteries of the capsule. Some of the cases showed within the liver and close to the hilum typical large vascular arches between the right and left branches.

The distribution of the arteries of the liver does not correspond to its anatomical division into lobes. The quadrate lobe is supplied chiefly by a typical arched vessel springing from the left branch. It has very little supply from the right branch. The caudate lobe is supplied by both the right and left branches, but chiefly by the right. These conditions should be taken into consideration in resecting a lobe.

The conditions found are shown in several roentgen plates and schematic drawings. NORDMANN (Z).

**Branham, J. H.:** Some Interesting Surgical Conditions of the Liver and Biliary Tract. *Am. J. Obst. & Gynec.*, 1921, i, 331.

According to Branham, a healthy gall-bladder should never be removed or subjected to operation. When there are symptoms sufficiently severe to demand operation the organ is usually so diseased that it is of little or no value and constitutes a menace to future health.

Cholecystostomy today shows a higher mortality rate than a few years ago. This is because it is now done in extreme cases of severe infection of the gall-bladder with complications.

Re-operations in gall-bladder disease are necessitated by recurrence of stones or by the formation of adhesions or fistulae. Stones are much more common after cholecystostomy, but may be formed in the ducts after cholecystectomy. Adhesions of such a character as to necessitate re-operation because of pain or interference with the mobility of the stomach or intestines are formed usually in severe cases in which there is suppurative peritonitis and long-continued drainage is necessary. In a given case of gall-stones or cholecystitis, adhesions should not be more frequent or severe after removal of the gall-bladder than after drainage, provided the removal is done carefully.

For several years Branham has operated by a method which is practically subperitoneal and which he describes briefly as follows:

After the abdomen is opened the ducts and neighboring organs are carefully examined; this can usually be done by palpation. If the disease is confined to the gall-bladder, an oval incision is made over the lower anterior surface of the organ and the peritoneal coat is dissected from the deeper tissues. When the duct is reached it can always be

recognized by the well-marked sphincter. A considerable margin of the peritoneal coat is left at the liver attachment. The duct is severed and, after it has been explored and emptied of stones, etc., a large catheter is fastened to it with a twenty-day catgut suture. The peritoneal coat from each side is stitched together and then to the ventral peritoneum. This leaves the catheter outside the peritoneal cavity and gives a smooth serous surface to cover the entire wound and prevent the formation of adhesions. By confining the incision to the accessible part of the organ, the suturing is made easier. In most cases a small cigarette drain left inserted for one or two days is all that is necessary. Operations performed in this way are rarely followed by adhesions and usually leave the patient in good condition.

Fistulae necessitating re-operation open from the gall-bladder or ducts into the small intestine, the colon, or the stomach. When the adhesions are very dense and extensive, gastro-enterostomy gives the best permanent relief. Re-operation may be made necessary also by failure of the drainage tract to close. In most cases this is due to obstruction by stones or stricture. M. I. MALONEY.

**McWhorter, G. L.:** The Surgical Significance of the Common Bile-Duct Sphincter. *Surg., Gynec. & Obst.*, 1921, xxxii, 124.

In a study of the sphincter action and surgical procedures to facilitate bile drainage, the author performed operative experiments on 45 dogs. His conclusions are as follows:

1. Stasis of the bile should be prevented by proper diet, exercise, and dress.
2. Physiological drainage of bile by means of a straight or T tube through the sphincter may be of value in certain diseases of the bile tracts in which bile is needed in the system or as a means of instituting duodenal infusion.
3. Diminution of sphincter action may be obtained surgically by cutting, dilating, or putting a tube through the sphincter.
4. The mechanics of bile drainage is important and recovery is dependent upon its proper application.
5. Primary suture of the common duct is apt to break in the presence of obstruction lower down or when there is a disturbance of the local blood supply. An abdominal drain should be inserted for a safety valve.
6. The sphincter normally guards the bile ducts from ascending parasites, foreign bodies, and infections. In certain disease or anatomical conditions of the bile passages, and possibly also of the pancreas, a diminution of its action may be desirable.

E. C. ROBISHEEK.

**Judd, E. S.:** Cysts of the Pancreas. *Minnesota Med.*, 1921, iv, 75.

It is a generally accepted theory that pancreatic cysts follow chronic pancreatitis. Scar formation may produce obstruction to the ducts. Judd



attempted to verify Archibald's theory that the inflammation is due to the entrance of bile into the pancreatic duct but in several cases he tested the cystic contents for bile without success.

The author reports a series of 41 cases of pancreatic cysts operated on at the Mayo Clinic. In 3, the cyst was found at operation for some other condition, and in many others the surgeon had difficulty in determining its relationship to other structures and whether it was a true cyst or a pseudocyst. A few cysts may undergo malignant degeneration, but only 2 in the author's series were malignant or associated with malignancy. Hydatid cysts of the pancreas are rare. Congenital cystic disease of this gland may be associated with the same condition in the liver and kidney. One patient who was past 50 years of age and without symptoms was found to have this condition. The cysts in the liver were drained on two occasions about two years apart. One true hæmorrhagic cyst was found soon after confinement, although there was no history of trauma. Cysts which follow hæmorrhage into the pancreas usually do not have an epithelial lining.

The formation of pseudocysts is attributed to abnormal action of the pancreatic fluid. Such cysts have thick fibrous walls without epithelium, usually present high in the abdomen, and may be associated with a collection of fluid in the lesser peritoneal cavity. The fluid content of true pancreatic cysts may be light-colored and viscid, but it is more often dark because of the presence of old blood, or red because of the presence of fresh blood. It may contain epithelial cells, fat, crystals of bile pigment, cholesterol, blood cells, and necrotic tissue. The origin of the cyst may be indicated by the presence of pancreatic enzymes.

Clinically pancreatic cysts may occur at any age; in the Mayo Clinic series they occurred between the ages of 21 and 68. The tumor presents as a rounded or oval semi-fluctuating mass at the umbilicus, in the midline above it, or just to the left of the midline. They vary greatly in size and usually are fixed, but may be movable if located in the tail of the pancreas. As the cysts enlarge, they grow forward, usually between the stomach and colon, but may present above the stomach or between the layers of the transverse mesocolon.

The symptoms are usually due to pressure on surrounding organs, such as the diaphragm, the colon, the bile ducts, or the stomach. In the cases reviewed their duration varied from three weeks to twenty-five years. Indigestion and vomiting are sometimes due to the associated pancreatitis. Glycosuria and diabetes apparently follow chronic pancreatitis. Pain and loss of weight were marked in some of the cases reviewed. Disease of the gall-bladder was frequently an associated condition; stones were found in 12 instances and a definite cholecystitis was present in 2. Three other patients had had previous operations elsewhere for gallstones. Two patients who had diabetes at the time

of operation died in coma about one year later; another developed diabetes after operation; and 4 others had sugar in the urine which cleared up under treatment.

Diagnosis is often doubtful and in many cases is impossible until an exploration is made. Mesenteric and ovarian cysts and splenic, renal, and retroperitoneal tumors must be differentiated. Experience is valuable as some tumors may be distinguished by palpation. The X-ray is of value in eliminating other lesions.

Enucleation is the ideal treatment, but may be impossible on account of adhesions and hæmorrhage. If too much pancreas is removed diabetes may follow. Often it is advisable to drain the cyst after suturing its wall to the parietal peritoneum or protecting the viscera with gauze packs. Drainage, which is usually prolonged, may be irritating to the tissues, and continues until the lining membrane has been destroyed. The cysts may be multiple or the drainage tract may close prematurely, necessitating two or more operations. Drainage was effected in 31 cases, the lining membrane was enucleated in 3, and the cyst entirely removed in 5.

In the 41 cases there was no death from operation. Extensive fat necrosis, a chemical change, was found in some instances, but there was no evidence of peritonitis in any case. Two patients died one month following the operation. Necropsy showed carcinoma of the pancreas and liver in one, and in the other, an alcoholic subject, an acute on a chronic nephritis. Another patient had an acute hæmorrhagic pancreatitis with multiple cysts. The cysts were drained, but the severe pain and vomiting continued. Five weeks later an enterostomy was made for feeding, but shortly afterward the patient died and necropsy showed a hæmorrhagic pancreatitis involving nearly the entire organ, marked fat necrosis, and acute yellow atrophy of the liver. In all the other cases, except a few recent ones in which drainage is still continuing, all symptoms have abated and drainage has apparently effected a complete cure.

MERLE R. HOON.

**Hofmann, A.: Extirpation of Two-Thirds of the Pancreas in Acute Hæmorrhagic Pancreatitis** (Extirpation von zwei Drittel Bauchspeicheldrüse bei akuter hæmorrhagischer Pankreatitis). *Arch. f. klin. Chir.*, 1920, cxiv, 1041.

In a case of acute hæmorrhagic pancreatitis the author removed the tail of the pancreas which showed a hæmorrhagic infarct. After splitting the gastrocolic ligament he passed his fingers gradually around the upper and lower edges of the pancreas, dissected the diseased part of the gland free on all sides, and removed it after placing a double ligature between the diseased portion and the normal head of the pancreas. Although the patient withstood the operation and at first improved, he died of heart failure.

This case proves that it is comparatively easy to remove the necrotic tail of the pancreas. In some



cases the procedure may be the means of saving life as the prognosis of acute pancreatitis without operation is very poor. GANGL (Z).

**Chand, G.: Complete Extirpation of Pancreas with Absence of Glycosuria.** *Indian M. Gaz.*, 1921, lvi, 6.

Chand reports an interesting case of extirpation of the pancreas with absence of glycosuria. The patient, a child 2 years old, was brought to the hospital July 4, 1919, with a globular, smooth, tense, and painless swelling in the middle of the abdomen. This swelling was dull on percussion but a thrill could be obtained. The tumor was about the size of a small coconut. The child had had occasional attacks of intermittent vomiting and diarrhoea. Its nutrition was but little affected. The duration of the complaint was six months.

On July 5 an exploratory incision was made in the median line over the tumor. When the peritoneal cavity was opened a cystic tumor was found. This was tapped and about 10 oz. of clear watery fluid were withdrawn. The cyst was so closely connected to the pancreas that it was impossible to remove it without removing the pancreas also. The primary incision was therefore enlarged, the vessels were ligated, and both the cyst and the pancreas were resected. Very little blood was lost. The wound was closed without drainage.

The wound healed by first intention and the child was discharged cured July 20, 1919.

The urine was examined before and after the operation, but no trace of sugar was detected.

The child was still living at the time the case was reported and its urine was still free from sugar although the chief part of its diet consisted of carbohydrates.

Pathologic examination of the specimen showed the cyst to be rather thin-walled and its interior smooth and free from outgrowth of any sort. The pancreas appeared to have been removed in its entirety, but as at one end a cut surface was found it is possible that a small portion may have been left. M. I. MALONEY.

**Keisman, M.: Splenic Thrombopenia (Frank's Essential Thrombopenia) Haemorrhagic Diathesis; Cure effected by Extirpation of the Spleen; Gaucher's Splenomegaly; Remarks on the Function of the Spleen** (Splenogene Thrombopenie (Essentielle Thrombopenie Frank); haemorrhagische Diathese; Heilung durch Milzexstirpation; Splenomegalie Typus Gaucher; Bemerkungen zur Milzfunktion). *Med. Klin.*, 1921, xvii, 72.

Good results from the removal of the spleen in various blood diseases have often been reported but are rare in splenic thrombopenia with hæmorrhagic diathesis. The author adds another case to those reported by Katznelson, Beneke, Schluter, and Ehrenberg.

A 17-year-old girl, very poorly developed, who had suffered for years from hypertrophy of the spleen and liver and thrombopenia, suddenly developed very threatening and rapidly increasing symptoms of hæmorrhagic diathesis.

The spleen was removed. Within a year all the symptoms disappeared, the body weight became normal, the patient developed so that her appearance corresponded to her age, and menstruation began.

This disease is due to a disturbance of the physiological function of the spleen; it is a "dys-function." SIMON (Z).

## SURGERY OF THE EXTREMITIES

### DISEASES OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Chelmonski, A.: Alimentary Bone Disease** (Maladie alimentaire des os; osteoporosis alimentaria). *Presse méd.*, Par., 1921, xxix, 115.

During the famine in Poland in the recent war a new disease of the bones was observed. This was of two types. The first was characterized by pain in certain bones, notably the ribs, the sacral bone, and occasionally the vertebræ. The pains were spontaneous or evoked on pressure. The bones involved were flexible and fragile and X-ray examination showed a diminution of calcareous salts. Autopsy demonstrated osteoporosis. This type was usually a secondary process, a complication of other diseases, especially tuberculosis. In the patient's appearance general inanition was evident. The cause was lack of food in general as well as of certain elements in the food. This form of osteoporosis may be termed "simple alimentary atrophy of the bones" or "osteoporosis."

The second type of osteoporosis of alimentary origin resembled osteomalacia. It developed progressively, most frequently in women of middle age, and was characterized by pain in the legs, sacral bone, and thorax associated with, or followed by, progressive paresis of the lower extremities. The patient waddled like a duck. The paresis was not due entirely to the pain, being dependant equally upon weakening of the muscles. The nutrition of the patient with this condition was good or even excellent, but the X-ray examination showed a more or less high degree of decalcification of the pelvic bones and os sacrum. This condition the author calls "pseudo-paretic osteoporosis" or "pseudo-alimentary osteomalacia."

The differential diagnosis of the second type from true osteomalacia is based on the following facts:

1. In Poland osteomalacia is very rare, but just now pseudo-paretic osteoporosis is very common.
2. Osteomalacia is usually associated with pregnancy and labor, while pseudo-paretic osteomalacia is in no way related to these two conditions.



3. The general aspect of the patient with true osteomalacia is cachectic; in pseudo-osteomalacia it is good.

4. In pseudo-paretic osteomalacia there is no pelvic deformity.

5. Osteomalacia attacks the rich as well as the poor; pseudo-paretic osteomalacia attacks only those whose nutrition is poor.

6. In osteomalacia the prognosis is poor while in pseudo-paretic osteoporosis it is usually good.

The reaction of the bones to insufficient nourishment is variously manifested in different persons, and in the same family different types and degrees of the disease may be observed. W. A. BRENNAN.

**Stewart, J. P.: A Clinical Lecture on Muscle Tonus, Tonic Rigidity, and Tonic Fits.** *Brit. M. J.*, 1921, i, 217.

Voluntary muscles, even at rest, are in a state of slight tonus which is dependent on the spinal reflex arc. A lesion interrupting any part of this reflex arc causes among other phenomena a loss of muscle-tonus. If the lesion is in the afferent or sensory limb it is often associated with sensory loss in the corresponding root area; if it is in the efferent or motor limb, it is associated with muscular weakness and atrophy.

The opposite condition of increased muscle tonus may arise from irritative conditions in the reflex arc.

All movements of voluntary muscles are executed through the anterior cornual cells of the spinal cord. These receive two types of motor impulses from the brain, namely, the voluntary and the involuntary. (The origin and courses of these impulses are illustrated by a diagram.) These impulses have a regulating effect also on muscle tonus and posture which is mutually antagonistic. Therefore if both sets are interrupted, normal tonus is diminished and the affected muscles become not only paralyzed but flaccid, while if only one tract is interrupted the affected muscles become hypertonic and rigid, and so-called spasticity is produced.

The spasticity due to typical pyramidal disease, ordinary hemiplegia, for example, is produced by unopposed non-pyramidal motor tracts, and the muscles, though paralyzed for voluntary movements, are still able to perform certain automatic movements.

In spasticity due to pure extra-pyramidal disease the automatic movements are diminished or lost, and yet because of the integrity of the pyramidal tracts, the patient is able to perform all ordinary movements with the spastic muscles.

When both sets of motor impulses, pyramidal and non-pyramidal, are cut off in the spinal cord, flaccid paraplegia results, the muscles lacking muscle tone. This flaccid stage lasts from one to three weeks. If the cord lesion is incomplete, the tonus is preserved and increased, that is, the paraplegia is spastic in type.

If there is a transverse lesion at the level of the cerebral hemispheres, cutting off the voluntary

motor impulses, but leaving intact the great sub-cortical mechanisms, the result is the so-called "decerebrate rigidity" in which both the upper and the lower limbs are rigidly extended while the neck and entire spinal column are tonically hyper-extended and the head is retracted. This is a purely destructive or negative lesion which in man is due usually to hemorrhage.

Acute decerebrate rigidity is usually a terminal phenomenon in a dying patient. Chronic incomplete decerebrate rigidity is sometimes seen, as in cerebral diplegia, and to a lesser degree in ordinary hemiplegia.

The well-known muscular rigidity which forms part of the classical syndrome of a pyramidal or upper motor neurone lesion is due to uncontrolled activity of the subcortico-spinal motor tracts.

Muscular rigidity occurs also in pure extra-pyramidal disease from unopposed action of the pyramidal tracts. This is seen typically in paralysis agitans in which rigidity of the face, trunk, and limbs invariably accompanies the tremor, and the extra-pyramidal tracts are both affected together. There is flexion of the hip and knee with dorsiflexion of the ankle so that the limb as a whole is drawn up or shortened, the so-called flexed type of paraplegia.

The fundamental function of the cerebellum is that of muscular synergia or co-ordination. If the cerebellum is experimentally destroyed the tonus of the voluntary muscles is at once diminished. In unilateral cerebellar lesions this loss of tonus is confined to the ipsilateral limbs and trunk.

Destruction of the anterior part of the middle lobe, or vermis, affects the tonus of spinal muscles on both sides, so that if the front part of the vermis is destroyed, the animal falls forward, and if the posterior part is destroyed the animal falls backward. Destructive lesions of the human cerebellum are rare. In unilateral lesions the ataxia is on the same side as the lesion and is accompanied by a transient hypotonia of the muscles of the affected side.

Irritative or positive cerebellar lesions increase muscular tonus and produce tonic rigidity.

Rarely, rigidity due to irritative cerebellar lesions which produce a variety of tonic spasms is seen in man. In these cases the typical hyperpronation of the forearms is often absent. The history of a boy 4 years of age who had cerebellar fits is given. A cerebellar decompression was performed with excellent results. C. F. ANDREWS.

**Sorrel, E.: The Diagnosis and Treatment of Osteo-Articular Tuberculosis** (Quelques généralités sur le diagnostic et le traitement des tuberculoses ostéo-articulaires). *Presse méd.*, Par., 1921, xxix, 101.

In confirming a diagnosis of tuberculosis based upon clinical and X-ray findings or a doubtful diagnosis, the laboratory is of great assistance. If an exudate pus or serofibrinous fluid can be obtained, laboratory tests will give conclusive positive or



negative evidence, especially after animal inoculation. If an exudate cannot be obtained, the general "humeral" reactions will add to the findings obtained by other methods of examination.

The nature of the surgical treatment of osteo-articular tuberculosis must be varied according to the patient's age. In the cases of children operative intervention should be reduced to the minimum. While some conditions will force the surgeon's hand, as a rule treatment should be conservative because in the young there is a tendency toward spontaneous recovery. Therefore, in most cases recourse must be had to immobilization.

In the adult the tendency toward spontaneous recovery is less than in the child and the cure of arthritis with preservation of more or less extensive movement is less frequent. In osseous tuberculosis in an adult resection is indicated.

In the old (in tuberculosis the fiftieth year is the limit of adult life), recovery from osseous tuberculosis is not to be expected. It is therefore best radically to remove the tubercular focus by amputation. Surgical treatment of osseous lesions due to tuberculosis in the adult and the aged is merely a confession of inability to treat the disease itself. In the child surgical treatment is of more avail, but even in these cases the cycle of the disease can scarcely be modified.

W. A. BRENNAN.

**Fossataro, E.: The Usual Treatment of Traumatic Lesions of the Hands in Relation to the Inabilities Which Result From Them** (Sul trattamento usuale delle lesioni traumatiche alle mani in relazione all' inabilità che ne consegue). *Policlin.*, Roma, 1921, xxviii, sez. chir., 1.

The principal causes of inability due to traumatic lesions of the hands (apart from mutilations) are ankylosis of the fingers due to suppuration of the articulations and adhesions of the tendons and deformity of the fingers due to vicious consolidation of phalangeal fractures. Theoretically there are surgical methods which should prevent such results but in practice they do not suffice.

In the treatment of phlegmons of the hand the author has obtained excellent results by bathing the hand in warm Schiassi fluid after the necessary incisions have been made. Early mobilization of the fingers and hand is of importance.

In cases of fracture of the phalanges many surgeons have adopted the Preiser method, closing the fist around a roll of cotton or over a cylinder of wood and thus subjecting the fractured finger to continuous extension until consolidation is effected. It has been found, however, that keeping the fractured finger immobile may be followed by a certain degree of dry arthritis of the phalangeal articulation. Stassen therefore places the finger in complete flexion and after reduction begins passive and active movements early.

Fossataro reports that in 21 cases of fractured phalanges complete flexion with massage and mobilization resulted in 21 perfect functional

recoveries. All other methods of treatment gave less favorable results.

When an incurable ankylosed or atrophic finger prevents the use of the hand, amputation of the finger should be considered, but if surgical methods of treating ankylosis and placing the fingers in an adaptable position are applicable, conservation is best.

In the surgery of the fingers the author usually prefers an amputation to disarticulation as disarticulation is complicated by the presence of the articular capsule and ligaments which must be removed. Amputation should be performed in the middle of the second phalanx and in the middle or lower third of the first in order that the corresponding metacarpo-phalangeal and inter-phalangeal articulations may be free.

W. A. BRENNAN.

**Pulvirenti, S.: A Case of Acute Purulent Lumbar Spondylitis** (Sopra un caso di spondilite acuta purulenta lombare). *Policlin.*, Roma, 1921, xxviii, sez. chir., 27.

Pulvirenti's patient was a male, 19 years of age. At the time of his admittance to the hospital the symptoms presented were of three types: those referable to the nervous system; those referable to the spinal column; and local and general symptoms of staphylococcal infection. The gravity of the nervous symptoms (which were motor in type), rigidity of the spinal column, slight kyphosis, pain on pressure on the lumbar spinous processes, etc. suggested an organic affection of the spinal medulla in the lumbosacral region. On the other hand, the acute but not sudden onset of the medullary symptoms, the absence of injury of the spinal column and of evidences of a recent spondylitis, the persistence of a suppurative focus (furunculosis), and the presence of general phenomena suggested the presence of a metastatic focus in the lumbar region.

Hæmatomyelia, chronic spondylitis, and possibly also medullary abscess could be excluded. All doubt was removed by an exploratory puncture between the fourth and fifth and the third and fourth spinous processes which revealed the presence of pus. From this pus the staphylococcus pyogenes aureus was obtained. The pus did not come from the arachnoid space as there were no symptoms of a purulent spinal meningitis.

The patient was immediately operated upon. A median incision about 20 cm. long was made in the lumbar region with its center over the third spinous process. When the bone was reached pus was found in the vertebral space between the third and fourth spinous processes. On the removal of these spinous processes there was a spurt of pus. The dural sac was intact and the external surface of the dura was smooth. The spinal canal was drained and the operative opening tamponed.

The postoperative course was good, the general condition responding rapidly. The patient was able to walk with the help of a cane at the end of forty days. Three months after the operation he left the



hospital completely cured. He has resumed his work and when last seen there were neither functional nor sensory disturbances and the organic functions were normal.

The operative findings and the final outcome of the case demonstrated that the condition was acute purulent lumbar staphylococcic spondylitis with the formation of a vertebral abscess in the upper lumbar region which compressed the cauda equina through the intact dura.

W. A. BRENNAN.

**Charier: The Treatment of Congenital Luxation of the Hip: The Position in the First Apparatus** (Sur le traitement de la luxation congénitale de la hanche: la position dans le premier appareil). *Rev. d'orthop.*, 1921, xxviii, 49.

One of the factors on which the result of treatment of congenital dislocation of the hip depends is the position in the first apparatus. The X-ray picture of the normal hip at the age at which a child is usually operated upon for luxation—that is, between the third and fourth years—shows that the bi-iliac line is tangential, or nearly tangential, to the head of the femur. The author designates as the “vertico-transverse plane” the vertical plane passing by the two acetabula, and as the “horizontal plane” the plane parallel with the table.

In the treatment Charier first determines the primary stability by noting the degree in which re-luxation can be made in both planes. When in a child of the average age the initial stability is satisfactory, he places the femur at about 75 degrees of abduction in the verico-transverse plane. The head of the femur is then tangential or nearly tangential to the bi-iliac line and the axis of the body of the femur is practically parallel with the bi-iliac line.

In certain cases it is necessary to push the knee toward the axilla: (1) when the horizontal plane is defective; (2) when the patient is very young; (3) when the X-ray shows that the femoral head is too high or the axis of the body of the femur is too much inclined downward and outward.

W. A. BRENNAN.

**Blanchard, W.: Anterior Bow-Legs.** *J. Orthop. Surg.*, 1921, n.s. iii, 1.

Nowhere in literature has the author been able to find a case of anterior bent tibiae presenting a shortening of 10 cm. in which the deformity was corrected with resulting full length of the leg.

Anterior bent tibiae complicate bow-legs and knock knees. In this deformity there is also a bend to the right or left. The most common type encountered is a combination of anterior bend and lateral bend.

The Grattan osteoclast is used for the correction of the deformity whatever the situation of the bend with relation to the joint. The fracturing bar is placed against the outside of the legs and opposite the apex of the bend. After fracture the legs are straightened by manual force. Previous to fractur-

ing the bent tibiae a tenotomy is done on the tendo achillis to permit lengthening of 2.5 cm.

If the anterior bend of the tibia is so extreme that the distance from the heel to the posterior articulation of the knee is shortened more than one half, the author recommends repeated osteoclasis to avoid destroying the vitality of the leg. An interval of three or four months should elapse between osteoclases and no more than 2.5 cm. of lengthening should be attempted each time. A transverse tenotomy of the Achilles tendon is always necessary before the correction. The strength of the Achilles is not impaired by repeated tenotomies.

No operation should be attempted in the acute or subacute stage of rickets. The roentgenogram must show evidence of complete eburnation. Osteoclasis must be rapid, consuming not over eight seconds.

JOHN MITCHELL.

**Gretsel: Operative Treatment of Severe Talipes Equinus** (Operative Behandlung schwerer Spitzfuesse durch Muskelverschiebung). *Muenchen. med. Wchnschr.*, 1920, lxxvii, 1412.

In severe cases of talipes equinus the author has used the following method:

Both insertions of the gastrocnemius are cut transversely through the tendon of Achilles so that a part of the tendon remains attached to the muscle. The belly of the muscle is then dissected from the soleus until the latter is laid bare.

A hollow sound is introduced through the half-moon shaped fissure for the vessels and nerves in this muscle, and the lateral head is cut through. The foot is held in dorsal flexion and the tense fibers of the median head are severed. The gastrocnemius is then brought down and, with the foot kept in dorsal flexion, it is again united without tension to the soleus and the Achilles a little above the point where it was cut.

PORT (Z).

## FRACTURES AND DISLOCATIONS

**Goddu, L. A. O.: Fracture Dislocation of the Third Cervical Vertebra.** *Boston M. & S. J.*, 1921, clxxxiv, 179.

The author reports a case in which the problems presented seemed to be: (1) reduction of the dislocation, and (2) the determination of the nature of the disturbance in the cord which caused the symptoms, and the part played by hæmorrhage and œdema in the symptoms. The method of treatment decided upon was as follows:

Head traction by means of a 6-lb. weight was applied night and day for three days. A judicious forcible manipulation in the proper direction was then made in an attempt to reduce the pressure symptoms.

The patient had a remarkably good return of function. At the time this article was written he had practically full use of both arms and only slight limitation in rotation and lateral bending of the head.

E. C. ROBISHAK.



**Coues, W. P.: The Diagnosis of Some Chronic Shoulder Injuries.** *Boston M. & S. J.*, 1921, clxxiv, 176.

The author illustrates some of the points touched upon in this paper by citing three cases. He arrives at the following conclusions:

Subdeltoid bursitis with injury to the supraspinatus tendon, unrecognized fracture of the greater tuberosity of the humerus without much or any displacement, and hysterical shoulder form a large part of the general group presented for examination. A careful study of each case will usually lead to a correct diagnosis. The treatment often consumes much time and patients are easily discouraged, but full function will be restored ultimately.

E. C. ROBITSHEK.

**Koetter, R.: Six Cases of Subcutaneous Fracture of the Olecranon Cured by Huelsmann's Method** (Sechs Faelle von subcutaner Olecranonfraktur geheilt nach einem Verfahren von Huelsmann). *Deutsche Ztschr. f. Chir.*, 1920, clx, 281.

A dorsal splint was applied in complete extension. The splint was removed on the second day. The swelling was pushed aside and the upper tip of the olecranon seized firmly with the thumb and index finger and pushed downward in the direction of the long axis of the arm so that the fractured surfaces were pressed tightly against each other. The forearm and the upper fragment were then flexed slowly at the elbow as a whole, this flexing being repeated until a right angle was reached. At first the movement was very painful. The arm was then bandaged again in complete extension.

This procedure was repeated after two days, and later at intervals of three days. The result was extraordinarily good. Six cured cases are reported. The duration of the treatment was very short. In every instance there was bony consolidation of the fragments and complete restoration of function.

COLMERS (Z).

**Ollerenshaw, R.: Rotation-Dislocation of the Astragalus.** *Brit. M. J.*, 1921, i, 155.

The author reports a case of forward dislocation of the astragalus which was seen on the orthopedic service of the Salford Royal Hospital.

The patient, a man aged 42, was struck by a heavy timber on the back of the left heel. The deformity was obvious as the upper articular surface of the astragalus was palpable under the skin of the dorsum of the foot. The fibula was fractured 2 in. above the malleolus. The X-ray examination showed that the astragalus had been rotated 90 degrees around the vertical axis. At operation the posterior surface of the astragalus was found to point directly outward and the head inward.

Manipulation was unsuccessful, but by open operation the deformity was reduced. There was practically normal function at the end of three months. The article includes plates of the ankle made before and after reduction. J. I. MITCHELL.

## SURGERY OF THE BONES, JOINTS, MUSCLES, TENDONS, ETC.

**Scheiber, V.: The Operative Treatment of Flail Joint** (Ueber die operative Behandlung der Schlottergelenke). *Orvosi hetil.*, 1920, lxiv, 425, 437.

The author discusses the mechanism of joints and the etiology, pathological anatomy, and diagnosis of flail joint. In his opinion the flail joint is caused by shortening of the bone and loosening of the joint. He has operated on flail joint of the shoulder, the knee, and the elbow.

The flail joint in the shoulder was caused by injury of the head of the humerus and the deltoid muscle. As a rule both injuries occur at the same time. In moderately severe cases Scheiber effects fixation of the soft parts; by means of transplanted fascia he fastens the humerus to the scapula. In severe cases he transplants a portion of the tibia to take the place of the missing portion of the humerus.

Flail joint of the elbow he treats by fixation of the soft parts as far as possible and by fastening the joint on both sides and behind with strips from the fascia lata. In severe cases he performs arthrodesis.

In severe cases of flail joint in the knee he fixes the joint by operation. After resection the joint ends are fastened with wire sutures, the pointed end of the femur is driven into the tibia, or simple union of the bones is brought about. His results are satisfactory.

LOBMAYER (Z).

**Cadenat, F. M.: Cineplastic Surgery of the Upper Limb** (Chirurgie cinéplastique du membre supérieur). *Rev. d'orthop.*, 1921, xxviii, 5.

Cadenat reviews the whole subject of cinematic surgery of the upper limb, including the techniques of Vanghetti, Putti, Bosch-Arana, and others.

There are now numerous varieties of artificial hands, but because of the difference between the power of the muscle and that of the artificial hand none of them seems to be exactly what is desired. Tuffier, who went to Italy to examine the cases operated on by Putti and Galeazzi, wrote, "The effect produced on the mobile parts of the prosthetic apparatus is very defective. The fingers may be flexed and extended but the useful power is very weak. In general, it is scarcely equal to 5 or 10 per cent of the initial power of the motor."

The future progress of cinematic surgery would appear to be more a matter for the constructor of prosthetic appliances than for the surgeon.

W. A. BRENNAN.

**Henderson, M. S.: Non-Union of the Humerus: Repair by Means of the Bone Graft.** *South. M. J.*, 1921, xiv, 148.

The author's study is based on the observation and care of 41 cases of non-union of the humerus, 30 of which had been operated on elsewhere, many of them two or three times. Thirty-four of the 41 patients were traced, and 25 (73.5 per cent) of these were found to have union. To obtain this percentage



it was necessary to operate more than once on a large number. There were in all 42 operations on 34 persons; that is, 1.25 operations to each patient. Of the 42 operations, 25 (59.5 per cent) were successful.

The literature on the subject brings out the fact that the humerus is probably the most difficult bone to deal with in cases of non-union. In 25 bone-grafting operations a successful result was obtained in 17 (68 per cent). Different methods of bone grafting were employed. The intramedullary graft was used 8 times with 4 successful results (50 per cent); the inlay graft was used 10 times with 7 successful results (70 per cent); and the massive graft was used 7 times with 6 successful results (85 per cent). Seven patients were operated on by a modified step operation in which beef-bone screws were used; good results were obtained in 3 cases (42.8 per cent). Nine patients were operated on by other methods such as the use of metal plates, celluloid plates, an ivory intramedullary peg, silver wire, etc.; a successful result was obtained in 5 cases (55 per cent).

Henderson considers the so-called massive-graft method the procedure of choice in operations for non-union in most of the bones and certainly in the humerus. A very large graft is taken from the flat internal surface of the tibia and applied to the fragments after their periosteum has been stripped and the outer surfaces of the cortex removed until the cancellous or endosteal layer is exposed. Against this layer which, being filled with osteoblasts, has strong bone-forming properties, is placed the endosteal surface of the graft, which is also filled with osteoblasts. The graft is then fastened on by the aid of four or more beef-bone screws which pass through the opposite cortex. Clinical experience shows that at least a large part of such a graft maintains its vitality and union is brought about much more rapidly than when other grafts are used. The roentgenograms show early union of the graft to the fragments.

Postoperative fixation is very important. A plaster of Paris body-cast with a trough for the arm is applied a few days before and is left on during the operation. After the operation the arm is put into the trough and held in place by strips of plaster of Paris bandage moulded over it. This is worn for six to eight weeks, at the end of which time a splint is applied for the period of convalescence. The splint is very simple. The base, a piece of cold-rolled sheet steel, is mounted to fit the curve of the thorax and has attached to it webbing straps with buckles. To this thorax-piece a piece of cold-rolled, round-edged flat steel is riveted, carried up into the axilla, down the arm, the forearm, and onto the hand, and provided with various semicircular pieces of sheet steel to fit the circumference of the arm. Web straps hold the arm on the frame, and the hand and wrist are held in moderate dorsiflexion. The splint is light and comfortable and enables the patient to wear a coat so that his disability attracts very little attention.

**Borelli, E.: Complex Dorsal Luxation of the Right Index Finger; Duplex Mechanism of Irreducibility; Operative Reduction** (Lussazione dorsale complessa dell'indice destro; duplice meccanismo di irreducibilità; riduzione cruenta). *Policlin.*, Roma, 1921, xxviii, sez. prat., 115.

Little is said in surgical textbooks regarding irreducible dorsal luxation of the fingers. The author has more than once reduced a complex luxation of the thumb, but before he had examined the case reported in this article he had never observed an irreducible dorsal luxation of the index finger. In this case the condition was complicated by luxation of the last four fingers. All of them except the index finger, however, were easily reduced. The luxations were due to a fall on the hand.

After unsuccessful attempts at bloodless reduction operation revealed the duplex mechanism of the luxation. The difficulty was due to the interposition of the glenoid ligament and the strangulation of the metacarpal through the musculo-aponeurotic aperture which fixed the metacarpal on the palmar side. The violence of the fall lacerated the articular capsule by forcing the metacarpals against its anterior wall. As is usually the case, this laceration occurred in the region of the metacarpal insertions of the capsule, and the phalanx drew the displaced glenoid ligament with it toward the dorsal side.

In the third, fourth, and fifth fingers the trauma ended here and reduction was easy, but in the index finger the consequences were more complex. The head of the second metacarpal having passed the capsular laceration and displaced the flexor tendons of the thumb, it lacerated the muscle fibers of the adductor of the thumb, passed through them and, after lacerating the palmar aponeurosis, remained under the skin and projected from it.

As it was impossible to reduce this luxation by non-surgical methods, the author made a free incision into the joint directly over the projecting metacarpal head. He was then able to free the bone from its fibro-muscular attachment, to restore it to its anatomical position, and to free the articular head of the phalanx from the interposed capsule.

W. A. BRENNAN.

**Casati, E.: A Case of Total Fracture of the Acetabulum** (Un caso di fratture in toto dell'acetabolo). *Policlin.*, Roma, 1921, xxviii, sez. prat., 118.

A boy aged 10½ years while descending a stairway was struck by a heavy falling weight on the right shoulder and thrown to the ground. Sharp pain was felt immediately in the inguinal and lower ileocæcal regions. The author was consulted after treatment had been given for nine days for fracture of the neck of the femur.

Examination showed the lower right limb in complete extension but without any tendency to external or internal rotation. The right leg showed a shortening of about 2 cm. as compared with the left. No pain was felt on pressure on the great trochanter



along the entire femoral diaphysis to the femoral condyles. Neither were the articulations of the foot and knee sensitive to pressure. Pressure in the right crural region elicited sharp pain in the right suprapubic region where a distinct swelling was palpated; movements of flexion of the right thigh on the pelvis and of internal and external rotation were painful but slight extension movements were not. All movements of the thigh were reflected to the tumor mass.

The symptoms indicated that the condition was not a fracture of the neck of the femur or a luxation of the hip. There were only two possibilities: either the acetabular cavity had been forced down and there was migration of the articular head into the lower pelvis or there was total fracture of the acetabulum. The author favored the latter assumption because: (1) in cases of embedding of the acetabulum flexion is either very limited or absent, (2) the aperture through which the articular head migrates into the lower pelvis is irregular and all movements, but especially those of rotation, are accompanied by a characteristic crackling sound which was lacking in the case reported, and (3) the great facility with which the limb could be put in its normal length and position without causing pain would have been impossible if the acetabulum had been crushed.

As the acetabulum is not fully ossified until the fifteenth year or even later it is easy to understand how a severe trauma could produce a total fracture.

W. A. BRENNAN.

### ORTHOPEDICS IN GENERAL

Jones, R.: *The Cameron Lecture on the Necessity of Orthopedic Training: Its Relation to the Prevention and Cure of Deformities.* *Brit. M. J.*, 1921, i, 181.

The author points out that the prevention of surgical tragedies is largely dependent on the general practitioner who frequently sees the beginning of disease. The general practitioner fills an extremely responsible position in most departments of his work, and this is especially true with regard to the early advent of the deformities associated with tuberculosis, rickets, and infantile paralysis. The correction of club-foot deformities should be instituted at birth even though the act of walking is necessary to complete the recovery.

Attempts should be made to correct the deformities caused by rickets in the early stages. Because of the danger to the small bones the child should not be allowed to crawl or walk. It should also be carried correctly and given proper food. The parents should not be told that the child "will grow out of it." When the bones are soft, the recumbent position, a frame, and a bandage will correct the worse deformities without the aid of drastic surgical methods. The child should be kept in the open air and it should not be allowed to walk until the bones are firm.

Reasonable State facilities should be afforded to eradicate tuberculosis. Any deformity due to faulty alignment should be prevented. A knowledge of the early stages and evolution of joint tuberculosis would relieve much suffering in children and lessen the congestion in hospitals.

The early treatment of infantile paralysis is in the hands of the family doctor. The surgeon rarely sees the case in the acute stage and then only when there is pain or when paralysis is discovered. Complete rest of the nerves and muscles is indicated. Postural errors should be avoided. Paralyzed muscles must not be allowed to stretch.

A large proportion of the injuries of the war were those requiring orthopedic treatment. Many failures in the treatment of these cases might have been avoided if universities and hospitals had taught practical orthopedic surgery more generally. The pre-operative and postoperative stages in such cases are important. The operative stage, although often essential, has only a relative value. Orthopedic operations are usually measures preliminary to the re-education of muscles and the restoration of function.

The deforming contraction of scars may be prevented by the recognition of certain principles. Wounds should be allowed to heal with the limb placed in the position opposed to the contractile force. Fully matured fibrous tissue has no more tendency to contract than any other tissue, but precautions against contractures must be prolonged as connective tissue is slow in maturing.

A plea is made for greater emphasis on postgraduate instruction as well as for better development of orthopedic departments in teaching and general hospitals. Teamwork on the part of the staff composed of the orthopedic surgeon and his assistants and nurses is the keynote of success.

The scope of orthopedic surgery includes: (1) congenital and acquired deformities of the spine and extremities, (2) infantile paralysis after the acute stage, (3) the deformities of adult paralysis, (4) stiff and ankylosed joints, (5) torticollis, and (6) disabilities of joints, such as rupture of the crucial ligaments, injuries to the semilunar cartilage, snapping hip, slipping patella, and conditions with regard to which the term "bonesetting" is used.

Country hospitals for crippled children are essential in any plan for the care of cripples. Reference is made to several of these in different parts of the British Isles in which excellent training is given.

H. T. JONES.

Ledoux, E., and Caillods, G.: *Sacralization of the Fifth Lumbar Vertebra* (*La sacralisation de la 5<sup>e</sup> vertèbre lombaire*). *Presse méd.*, Par., 1921, xxix, 123.

The authors report 7 typical cases of sacralization of the fifth lumbar vertebra, all those of persons who for a long time experienced pain the etiology of which remained obscure until it was cleared up by an X-ray examination.



As a rule the manifestations of sacralization make their appearance between the twentieth and thirtieth years of age. One of the cases reported, however, was that of a child  $5\frac{1}{2}$  years old. This fact led the authors to determine the relationship between the time of complete ossification of the vertebral column, and particularly of the fifth lumbar vertebra, and the manifestation of sacralization.

They found that there is a secondary ossification in the region of the fifth lumbar vertebra which begins approximately between the fifteenth and sixteenth years and is completed at the twenty-second year of age in women and at the twenty-fifth year in men. In this secondary complementary ossification the ossification of certain spinous processes is perfected. The areas and points of com-

plementary ossification vary: the atlas has only one point, the axis two points, the majority of the vertebrae five points, and the lumbar vertebrae seven points. There may be also super-ossification. In examining the roentgenogram of the young patient whose case is reported incontestable evidence was found that secondary ossification had begun at this extremely early age.

In the pathogenesis of sacralization of the fifth lumbar vertebra the osteogenetic energy of this vertebra might be compared with that of the first sacral. The points of ossification of the fifth lumbar may evolve pathologically toward the sacral type and in such cases the development of the first sacral may often be obstructed in proportion to the sacralization of the fifth lumbar. W. A. BRENNAN.

## SURGERY OF THE SPINAL COLUMN AND CORD

**Marshall, H. W.: Scoliosis.** *Boston M. & S. J.*, 1921, clxxxiv, 31.

Opinions as to the etiology of scoliosis are numerous and conflicting. Some orthopedists regard muscle weakness as the cause, others attribute the condition especially to anatomical defects, while still others regard the remote causes of muscle weakness as the responsible factors.

The vertebrae are made up of thin cancellous bone. The posterior regions of the vertebral column are strong osseous structures. Intervertebral articular processes limit motion of the spine. Elasticity in thick intervertebral discs permits slight rotation. Intervertebral muscles hold or pull back separate vertebrae into normal position when they have been subjected to external strain. The contraction of short intrinsic rotators of the spine effect the re-adjustment of the intervertebral articulations. Longitudinally arranged muscles bridge the larger groups of vertebrae and help to hold the spinal column straight.

Many variations occur in the bone. The vertebral bodies, the transverse processes, the laminae, and the spinous processes may be irregular. The X-ray shows that such variations may be present in persons who have straight spines with good normal function.

Variations are found also in the intrinsic spinal muscles. Occasionally congenital differences between opposed sets of spinal rotators are so great that the defect is never completely overcome. In such cases there is congenital scoliosis of muscular origin. Vascular defects account for many slight scoliotic curves.

The author's conclusions, on which he bases his treatment, are as follows:

1. Acquired scoliosis with no history of anterior poliomyelitis is due to unilateral congenital differences in the development of the spinal muscles.

2. Faulty blood conditions are contributory factors in the development of acquired scoliosis.

3. In some cases congenital scoliosis is due to

marked congenital differences between homologous members of balanced spinal muscles.

4. Congenital scoliosis is the result also of congenital structural variations in the vertebrae.

5. Marked congenital scoliosis is due at times to slight unilateral congenital differences in muscles associated with congenital variations in the vertebrae.

6. Compensated vertebral variations are of minor importance in the development of scoliosis.

7. Occupational conditions contribute to acquired scoliosis.

8. Other factors are anterior poliomyelitis, empyema, hip disease with unilateral shortness of the leg, torticollis, and rachitis. R. S. REICH.

**Langworthy, M.: Bilateral Forward Dislocation of the Fifth Cervical Vertebra with Reduction by Manipulation.** *J. Am. M. Ass.*, 1921, lxxvi, 447.

The patient, a truck driver 28 years of age, was injured in an automobile accident. He was found pinned underneath an overturned truck with his head and neck bent forward. He was still conscious when first discovered, but became unconscious a few minutes while he was being moved. Examination disclosed considerable interference with respiration; this was greatly relieved by traction on the neck. The patient was in severe shock.

Roentgenograms of the cervical spine revealed in the lateral view a bilateral forward dislocation of the fifth cervical vertebra on the sixth, with slight impaction of the body of the fifth. Anteroposterior views, although the stereoscopic plates were excellent, revealed nothing sufficiently definite to warrant a diagnosis without the lateral view.

The symptoms present were priapism, numbness and tingling in the right hand and forearm and over the entire left lower limb, frequent coughing, and the appearance of fresh blood in the sputum. The knee jerks and the gross eye findings seemed normal. There was no motor paralysis. Respiration was difficult.



Five and a half hours after the injury the patient was anesthetized with ether. When well relaxed, he was slid upward on the table so that the operator could hold his head in his hand free from any other support. The method of Walton was followed, an attempt being made to slip the articular facet, first of one side and then of the other side, back into position on the facets of the vertebra below. As the movements were completed a distinct "chug" was heard and felt in the neck. Immediately afterward the movements of the neck were free in all directions. Roentgenograms taken a little later showed that reduction had been accomplished. The patient was put back to bed with the head, neck, and shoulders supported by large, heavy sandbags.

The next day the priapism disappeared and the numbness and the tingling began to decrease. On the fourth day the patient's condition was so much improved that, with a plaster cast supporting the weight of the head on the shoulders and protecting the neck, he was allowed to sit up. He was discharged from the hospital on the fourteenth day. At that time he was still weak but walked well and was without discomfort. Ten weeks after the injury movements of the neck were normal in extent, although still somewhat weak. M. I. MALONEY.

**Auerbach, S.: The Differential Diagnosis Between Tumor of the Spinal Cord, Serous Circumscribed Spinal Meningitis, and Caries of the Spinal Column** (Die Differentialdiagnose zwischen Tumor im Bereiche des Rueckenmarks, Meningitis serosa circumscripta spinalis und Caries der Wirbelsaeule). *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1920, lx, 1.

Different investigators have given seven distinguishing signs in the differential diagnosis of the conditions named. After testing them critically, however, it is found that an exact differential diagnosis is not always possible. According to the author the difficulties in the diagnosis are so great that serous circumscribed spinal meningitis is never diagnosed with certainty except at autopsy.

Caries of the spine can be somewhat more easily diagnosed from primary tumors and tuberculosis by means of a carefully taken history. In metastases of carcinoma, however, there are sometimes isolated tubercles. Roentgen pictures taken in a lateral position are often of value. Lumbar puncture showing a yellow coloring of the spinal fluid and Nonne-Apelt, Paudy, and Wassermann examinations are significant, but the information given is not absolutely definite. WEICHERT (Z).

## MISCELLANEOUS

### CLINICAL ENTITIES—GENERAL PHYSIOLOGICAL CONDITIONS

**Mackenzie, J.: The Theory of Disturbed Reflexes in the Production of Symptoms of Disease.** *Brit. M. J.*, 1921, i, 147.

The object of the Institute for Clinical Research in St. Andrews is defined as the "prevention of the diseases that are common amongst the people."

In order to obtain a definition of disease the phenomena were analyzed in 1,000 cases. With regard to the simple disease of conjunctivitis it was found that a complete diagnosis was made in relatively few cases, for example when the injurious agent was recognized as being a foreign body or, as is the case in typhoid fever, pneumonia, and diphtheria, a microbe.

In some instances the reactions occur in such definite groups that they can be differentiated. In still others the entity can be determined, but the etiology is unknown; for example, migraine, epilepsy, and diabetes. The majority of cases belong to a fourth group in which it is impossible to recognize the agent or to group the symptoms. The nomenclature is generally based on the presence of a dominant symptom or a number of symptoms. To this group belong all chronic diseases, even though they may be recognized by physical signs. These are probably secondary diseases, the original cause of which it is impossible to determine.

Prevention of disease can never be achieved until diseases can be recognized, and in this respect the recognition of symptoms is of primary importance.

According to their mechanism, symptoms are classified as structural, functional, and reflex. The last group is due to a peculiar stimulus setting up definite reactions.

Time and observation have shown that the vast majority of symptoms of disease are disturbances of normal reflexes. Disturbed reflexes may be said to be produced by the nature of the stimulus acting on a part of the reflex arc, the impulse entering through the nervous system. By altering in a positive or negative sense the receptivity of the central or peripheral parts of the reflex, the agent (chemical or thermic) enters through the blood stream.

In many diseases all the symptoms on which a diagnosis is based are reflex in origin; in some, the reflexes are disturbed by the entrance of the stimulus through the nervous system, and in others the disturbance is through the circulation. J. B. DOYLE.

**Graham, E. A.: Some Surgical Aspects of Asphyxia.** *Ann. Surg.*, 1921, lxxiii, 170.

Disturbances of tissue respiration in the human body may result from: (1) interference with the intake of oxygen, (2) interference with the normal power of the blood to carry oxygen or to remove carbon dioxide, (3) interference with the circulation of the blood, and (4) interference with the power of the tissues to utilize oxygen.

In carrying out a surgical procedure the surgeon may meet with some phase of all of these factors.

Interference with the normal intake of oxygen will occur not only when there is obstruction of the



upper air passages but also when the normal alveolar space of the lungs is reduced and when rarefied air is breathed. The common causes of a reduction in the available breathing area are to be found either in conditions within the lungs, such as œdema and inflammatory exudates, or conditions outside of the lungs, such as abnormal pressure, which limit pulmonary expansion.

If air is injected into one pleural cavity of a normal human thorax until a pressure of 10 cm. of water is obtained, the pressure in the opposite pleural cavity will vary from 9 to 9.5 cm. of water.

If an open pneumothorax is created on one side in the normal living dog a characteristic response occurs which is manifested not only by a change of intrapleural pressure on the opened side, but also by a change of the same kind and of practically the same degree on the unopened side.

It is possible to maintain life as long as the lungs can inspire the tidal air, which normally varies from 300 to 500 c.cm. Considerable encroachment on the volume of the two lungs is possible before a stage is reached at which the lungs can no longer obtain the tidal air. In the compensatory reaction the thorax is enlarged by an increase in the amplitude of the respiratory movements so that actually more air may enter through the pneumothorax opening without encroaching on the tidal air to the same extent than would be the case if the thorax were not enlarged.

In the case of a closed pneumothorax the conditions are very different from those in an open pneumothorax. In a closed pneumothorax no additional air can enter no matter how much is contained in a pleural cavity. Therefore the animal is obliged only to increase his respiratory effort sufficiently to create sufficient negative pressure to allow him to take in the requisite amount of air to maintain oxygenation of the blood. Under conditions of rest this amount is equivalent only to the tidal air, which in the human being is only a relatively small fraction of the vital capacity (from about one-seventh to one-twelfth). When an open pneumothorax is converted into a closed pneumothorax, particularly if the closure is made at the end of expiration, the amount of air enclosed in the pleural cavity is very much less than the normal difference between the tidal air and vital capacity, and therefore there is comparatively little dyspnoea.

The applications of these newer conceptions of the physiology of pneumothorax are very extensive, but they have a particular bearing upon the treatment of empyema and wounds of the thorax.

During the winter of 1917-18 the military camps in the United States were ravaged by a severe epidemic of respiratory infections associated with a hæmolytic streptococcus. Conspicuous features of this epidemic were a very extensive bronchopneumonia and a high incidence of empyema. Clinically, during the acute stage of the illness, an extreme grade of cyanosis, dyspnoea, and air-hunger were common, and at autopsy a ready explanation was

found in the fact that many of the bronchioles were completely occluded both by contained exudate and by œdema and induration of their walls.

In general, the method of treatment employed at first was the conventional establishment of open drainage, either by a simple thoracotomy or a rib resection, as soon as the presence of fluid containing streptococci was diagnosed. Alarming reports of the high mortality of these cases led to the appointment of an Empyema Commission, of which the author was a member. As a result of the investigations of this commission a change was made in the plan of treatment. Instead of inducing early drainage, aspirations with a Potain aspirator were performed as often as necessary, with the idea of delaying operation until the active pneumonia had subsided. Following this procedure there was an immediate drop in the mortality.

Disturbances in the power of the blood to carry oxygen include all those conditions in which the hæmoglobin is either reduced in amount or so changed in form that the normal quantity of oxyhæmoglobin is not present. Such a condition is always encountered in connection with a severe anæmia, either acute or chronic.

Any condition which disturbs the normal transport of oxygen from the lungs to the tissues will also result in asphyxial effects to a more or less degree. Such a condition is encountered locally whenever an important vessel is occluded or destroyed. Disturbances of the circulation which are accompanied by general asphyxia are found particularly in uncompensated heart disease, shock, and pneumothorax.

Since the ultimate act of respiration consists in the utilization of oxygen by the cells and the giving off of carbon dioxide, it becomes evident that, theoretically at least, conditions may arise which would disturb the normal power of the tissues to utilize oxygen even when it is available. This reduction in tissue respiration is independent of any important disturbance of the intake of oxygen, of the oxygen-carrying power of the blood, or in the circulation of the blood. Its explanation, therefore, must lie in the inability of the cells to utilize oxygen even when it is available. The opinion is now general that narcotic drugs as a class interfere with the power of the cells to utilize oxygen. In diabetes mellitus there is inability on the part of the tissues to utilize oxygen for the combustion of sugar notwithstanding the fact that there is no demonstrable deficiency of general oxidation. As a result, some of the conspicuous features of asphyxia are present in this disease.

It is a very old observation that any measure which completely shuts off the supply of oxygen to a part for a long enough time causes necrosis of that part. It is also well known that such a part has a tendency to imbibe water if water is available and to swell.

Other morphological effects of disturbed oxidation are fatty degenerative changes and a tendency



to the production of hæmorrhages. Every severe asphyxial condition is accompanied by hæmorrhage. This may be localized if the asphyxia is local or more or less generalized if the asphyxia is general, as in obstruction of the trachea if death does not occur too suddenly.

Other effects of asphyxia consist of changes in the nature of the act of respiration, the effects on muscles, and glycosuria. In cases of acidosis the pulmonary ventilation is increased by a greater amplitude and also by a greater rate of respiration, constituting sometimes even a condition of air-hunger.

The response of the muscles to the effects of asphyxia is of special interest to the surgeon. Contractions usually occur and these are often very violent. The effects on the blood vessels are also important and are of two kinds, depending upon whether the vasomotor center in the medulla and the spinal centers are involved, or the asphyxial process is more local. In the former case the response is a general vasoconstriction with a resulting rise in blood pressure which will gradually drop as the severe state of asphyxia persists. All the evidence is in favor of the assumption that this phenomenon is due to the action of carbon dioxide and other acid substances rather than merely a lack of oxygen.

The occurrence of glycosuria in asphyxial conditions is an old observation, apparently having been made originally by Richardson in 1862 in experimental carbon monoxide poisoning.

There are many surgical conditions in which the effects of asphyxia are conspicuous. Of the agents most commonly employed to produce general surgical anaesthesia or narcosis, chloroform is the most powerful in causing asphyxial effects and nitrous oxide the least harmful in this respect. This knowledge has led to the almost complete abandonment in America of chloroform as an anæsthetic agent and the substitution for it of ether or nitrous oxide.

Other surgical conditions in which the effects of disturbed tissue respiration are conspicuous are severe hæmorrhage and secondary traumatic shock. In one case oxygen carriers are completely removed from the body and in the other they are removed, at least temporarily, from active circulation.

In cases of severe acute anæmia from hæmorrhage practically all of the various classical signs of tissue asphyxia may be observed.

In cases of intestinal obstruction and in acute dilatation of the stomach the classical features of tissue asphyxia are usually strikingly shown, at least locally.

Those effects of asphyxia which result in definite pathologic lesions can be recognized by gross and microscopic examination. The other types of effects, the physiological disturbances, usually require chemical methods for their detection. Of the physiological disturbances one of the most important is acidosis; most of the others are more or less intimately related to this condition. There are two clinical findings of some value in the recognition of a pronounced acidosis. One is the fruity odor of

acetone on the breath, and the other is the inability of the patient to hold his breath for more than a few seconds.

In cases of acidosis with impaired renal function there is no doubt that chloroform is the most dangerous of the common anæsthetic agents.

In conditions of established acidosis of any type the administration of alkali in the form of sodium bicarbonate is helpful. Caution should be exercised, however, in injecting it intravenously as excessive quantities of alkali are in themselves toxic. The use of the bicarbonate should be controlled by carefully watching the urine and should never be pushed beyond the point at which neutrality or slight alkalinity is obtained.

The copious administration of water is also important. In order to insure the maximum elimination of acid the urinary output must be maintained as nearly normal as possible or must even exceed the normal.

M. I. MALONEY.

**Johan, B.: Cortical Epilepsy Caused by a Calcified Cysticercus** (*Rindenepilepsie verursacht durch verkalkten Cysticercus*). *Orvosi hetil.*, 1920, lxiiv, 389.

A woman of 54 who had always been healthy, suddenly, after some excitement, experienced a trembling of the right arm. Two days afterward, on lifting a basket, she had spasms in the right hand and became unconscious for a short time. Subsequently the spasms in the right arm recurred frequently and extended to the right leg.

A week after the first appearance of the symptoms she came to the clinic where typical Jacksonian epilepsy was observed on the right side in the face, arm, and leg. These attacks came on every five minutes and lasted two or three minutes.

At operation the left motor cortical center was laid bare, but no visible or palpable changes were found; four brain punctures also gave negative results. Death occurred twenty-four hours after the operation.

At autopsy a nodule about the size of a millet seed which could be palpated with the naked hand, but not when a rubber glove was worn, was found at about the center of the left frontal convolution. This and two similar nodules found in the intestine were shown by microscopic examination to be calcified cysticerci.

In the author's opinion the epilepsy was due to these nodules and the spasms were caused by the slight toxic contents of the nodules or were anaphylactic phenomena.

POLYA (Z).

**Jost, E.: The Treatment of Chilblains with the Mercury Quartz Lamp** (*Die Behandlung der Frostbeulen mit Quecksilber-Quarzlicht*). *Schweiz. med. Wchnschr.*, 1920, L, 1192.

The treatment of chilblains with the quartz lamp has given excellent results even in cases in which there was ulceration. The distance between the limb to be treated and the lamp varied from 30 to



50 cm. The first treatment was continued for five minutes and each of the succeeding treatments for five minutes longer. The second treatment was given on the next day after the first, and the succeeding treatments every other day. Five or six treatments are necessary. The pain generally stops after the first treatment.

JASTRAM (Z).

**Yankauer, S.: Symposium on Borderline Diseases.**  
*Laryngoscope*, 1921, xxxi, 101.

This article is limited to the diseases of the lungs and bronchi which have been brought into the field of the laryngologist by the invention of the bronchoscope.

The author is convinced not only that bronchoscopy is indispensable for the diagnosis of obscure pulmonary lesions but also that the indications for surgical interference in operable conditions of the chest can be determined most accurately by this means. Among about 60 pulmonary cases he has been able to discover 13 cases of tumor of the lung, both benign and malignant, and to verify the diagnosis by microscopic examination of specimens bronchoscopically removed; among these cases he found a few foreign bodies not previously suspected and not demonstrable by means of the X-ray. Cases of pulmonary suppuration have been benefited and a few of them cured by bronchoscopic irrigation.

The most striking results have been obtained in the treatment of whooping cough. The author feels justified in stating that daily injection into the larynx of 20 to 30 minims of a 4 per cent solution of antipyrin by means of the direct laryngoscope will usually cause an immediate and very decided diminution in the number and severity of the attacks of coughing, and that in some cases the disease will be aborted by a single treatment.

W. H. NADLER.

**Powers, C. A.: The Work of the American Society for the Control of Cancer.** *Med. Rec.*, 1921, xcix, 211.

The American Society for the Control of Cancer had its origin in the American Gynecological Association, delegates from which met in May, 1913, with delegates from the American Surgical Association and other representative national bodies to found a national organization "to disseminate knowledge concerning the symptoms, diagnosis, treatment, and prevention of cancer, to investigate the conditions under which cancer is found, and to compile statistics in regard thereto."

In an address delivered in the Fall of 1920, Greenough stated that in the cancer problem four lines of attack present themselves for consideration:

1. The education of the public regarding the early symptoms of the disease.
2. The instruction of the medical profession as to the actual facts of this serious situation in order to bring about earlier diagnosis.
3. The promotion of investigations on the part of surgeons in regard to more effective means of operative treatment.

4. The promotion of investigations in the laboratory in regard to the causes of cancer and methods of treatment other than operation.

It is well known that even today an average period of ten months elapses between the discovery by the patient of the first symptoms of cancer and the time he seeks medical advice. It is the aim of the Society to reduce this period as nearly as possible to one day. Further, it is endeavoring to aid the practitioner in acquiring the ability to make a thorough, suitable examination and to give adequate advice.

Cancer is often considered a disgrace. It is in no way a disgrace; it is only one of the most terrible of misfortunes. One of the important duties of the Society consists in familiarizing the people with the word "cancer," teaching them that the condition is not a blood disease, that it is not contagious, and that it cannot be communicated by one person to another.

Under the chairmanship of Greenough of Boston, a committee of the Society has prepared a handbook for the profession which is to be distributed as widely as possible.

A special pamphlet has been prepared also for nurses. No activity in the domain of cancer can be more important than this, and the most valuable way of instructing the people regarding the simple facts connected with cancer consists in giving well-considered talks to groups. In these talks the plain leading facts should be stated. The early symptoms in such regions as the breast, the uterus, the skin, the lip, etc., should be described in simple, non-technical language.

Publicity is the keynote to the campaign. The universally distributed motion picture houses of today are capable of furnishing wonderfully effective publicity. In preparing for a cancer campaign in Denver the following notice was set out during periods varying from two or seven days in eight of the principal downtown motion picture theaters:

"Cancer—The American Society for the Control of Cancer says:

"1. That 85,000 people die yearly in the United States from this dread disease.

"2. That the majority of these deaths could be prevented if the condition were taken early.

"3. That in early recognition lies the hope of cure.

"Cancer campaign in Denver next week! Watch the newspapers for notices."

Such publicity is very effective and might be employed in practically every city, and even in small towns, in the United States.

Powers believes that in time a specific for the prevention or cure of this disease will be found. Even then, however, education will have its place, and in the meantime education holds first place.

M. I. MALONEY.

**Broders, A. C.: Squamous-Cell Epithelioma of the Skin.** *Ann. Surg.*, 1921, lxxii, 141.

The broad term "skin cancer" usually includes basal-cell epithelioma, or rodent ulcer, and squamous-cell epithelioma. It should include four types



of epithelioma; that is, basal-cell, squamous-cell, melanotic, and non-melanotic melano-epithelioma. On the basis of 100 their capacity to cause death is approximately 35 for the first, 65 for the second, and 95 for the last two types. The recognition of the type is therefore important from the standpoint of prognosis. Carcinoma of the sweat and sebaceous glands should not be included in this classification of "skin cancer" any more than cancer of the breast.

No cells of the body are more prone to change their form than epithelial cells. Not infrequently cells are seen in neoplasms which closely resemble muscle cells and fibroblasts, but their origin can be traced directly to the basal layer of the skin. The malignant epithelial cell is capable of polymorphism. When a squamous-cell epithelioma develops in an organ in which columnar epithelium is found normally, however, the regenerative cells which under ordinary circumstances produce columnar epithelium produce squamous epithelium instead.

The habitual use of the term "cancerous degeneration" is incorrect. MacCarty believes that cancer is a regenerative rather than a degenerative process. Cancer like any other tissue may degenerate as the result of the action of enzymes or deprivation of nourishment effected by fibrous connective tissue. The body cells are subject to anabolism and katabolism. Chronic destruction of epithelial tissue is often followed by cancer; for example, an ulcer on the lip. The destruction is katabolic; the regeneration of the cells of the germinal layers is anabolic. If this latter process predominates, the ulcer is healed by normal epithelium; if the former predominates, the ulcer continues to grow. If cancer develops on the border of the ulcer, however, it has both regenerative and destructive properties. Cancer cells are undifferentiated cells which possess the power to invade and migrate and, depending on their degree of cellular activity, the power to cause the death of the entire organism.

All malignant neoplasias are regenerative destructive processes probably following excessive chronic destruction of differentiated cells. In support of this view is the conclusion of Maud Slye: "Cancer and reproduction both being growth processes, draw upon the same energy residuum and are made possible by the same food. Hence the food and energy used by one are withheld from the other." Also upholding it is the fact that if the female is constantly pregnant, energy and food are withheld from the tumor and it grows with extreme slowness, while if well-advanced tumor growth considerably antedates pregnancy, offspring are rarely brought to birth, or if they are delivered, they are few, small, and undernourished, and rarely suckle.

Broders previously brought out the fact that the more epithelioma tends to differentiate, the lower the degree of malignancy; he believes that this principle can be applied to malignant neoplasia in general.

Squamous-cell epitheliomata of the skin and lip are graded 1 to 4, depending on the degree of cellu-

lar activity. If the epithelioma shows a marked tendency to differentiate, that is, if about three-fourths of its structure is differentiated epithelium and one-fourth is undifferentiated, it is graded 1. If the percentage is about equal, it is graded 2. If the undifferentiated epithelium forms about three-fourths of it and the differentiated one-fourth, it is graded 3. If the cells have no tendency to differentiate, it is graded 4. The number of mitotic figures and the number of cells with single, large, deeply staining nucleoli, one-eyed cells, are important factors in the grading. An endothelial leucocyte is also a one-eyed cell, but differs from the true one-eyed cell of malignancy in that it lacks body. Not all malignant cells have a single nucleolus. As a rule the more malignant the neoplasm the more irregular and ill-defined are its cell nuclei. Cells which are incapable of regeneration are not cancer cells; on this reasoning, the basis of grading epitheliomata is formulated.

The author reports 256 cases of squamous-cell epithelioma of the skin which represent 12.8 per cent of 2,000 cases of general epithelioma observed in the Mayo Clinic from November 1, 1904, to July 22, 1915. This type of epithelioma occurs more often in males than in females, the proportion being 4 to 1. The average age is 59 years. The site of cancer was preceded by a mole, wart, pimple, scab, ulcer, leukoplakia, crack, wen, blister, or lump in 51 per cent. There was a history of injury in 23 per cent; the average duration of the lesion was four years. Seventy-eight per cent of the epitheliomata occurred above the clavicle. Twenty-eight per cent of the patients had been treated with acid, paste, plaster, etc. previous to their admission.

Twenty-six per cent had been operated on before entering the Clinic; 92 per cent were operated on at the Clinic. Regional lymph nodes or salivary glands were not removed in 77 per cent; metastasis was demonstrated in 61 per cent of the 22 per cent in which these glands were removed. Cervical lymph nodes were involved in 31 per cent; submaxillary lymph nodes in 28 per cent; parotid lymph nodes in 25 per cent; the parotid salivary gland in 25 per cent; and axillary and inguinal lymph nodes each in 15 per cent. Grade 1 represents 8 per cent; Grade 2, 70 per cent; Grade 3, 17 per cent; and Grade 4, 5 per cent. The average duration of the lesion according to grade was longest in Grade 2, five years, and shortest in Grade 3, three years. The size of the lesion was largest in Grade 4 and smallest in Grade 1.

Fifty-two per cent of the patients operated on and traced are dead and 48 per cent are living. Eighty-two per cent of the living patients report good results, having been free from the disease on an average of seven years. Of those who died, 65 per cent died of epithelioma. Those treated with plasters, etc. before entering the Clinic did not have such good results as those not so treated. Ten per cent of patients with metastasis are living; no patient



with cervical lymph nodes or more than one group of any lymph nodes involved has been reported as living. All patients reported dead who had metastasis, died of epithelioma.

Sixty per cent of those operated on and in whom no metastasis was demonstrated are living and in good condition. Good results were obtained in 6 per cent of the cases with metastasis, in 78 per cent of those without metastasis, and in 66 per cent of those in which no regional lymph nodes or salivary glands were removed. Poor results were obtained in 86 per cent of the cases with metastasis, in 22 per cent of those without metastasis, and in 25 per cent of those in which no lymph nodes or salivary glands were removed. The known cases of death from epithelioma were: Grade 1, 0; Grade 2, 61 per cent; Grade 3, 86 per cent; Grade 4, 100 per cent. The total good results are: Grade 1, 93 per cent; Grade 2, 65 per cent; Grade 3, 41 per cent; and Grade 4, 0. The total poor results for Grade 1 are 0; Grade 2, 26 per cent; Grade 3, 54 per cent; Grade 4, 100 per cent.

The article is made very comprehensive by the addition of 18 photomicrographs illustrating the four grades of epitheliomata and other points in the microscopic pathology. Diagrams show the sites of the lesions and their points of metastasis. There are also 19 very complete statistical tables.

C. F. ANDREWS.

#### SERA, VACCINES, AND FERMENTS

**Laemmerhirt: The Results of Treatment with Friedmann's Vaccine in Surgical and Pulmonary Tuberculosis** (Ueber Heilerfolge bei chirurgischer und bei Lungentuberkulose mit der Friedmannschen Vaccine). *Med. Klin.*, 1920, xvi, 553.

Laemmerhirt summarizes the results of the use of Friedmann's vaccine in surgical and pulmonary tuberculosis as follows:

Recovery occurred in 9 cases of surgical tuberculosis, some of which were old and had been treated unsuccessfully by other methods. In 1 case of tuberculous caries of the sternum the vaccine failed. Three cases in which combined methods were used are not taken into consideration as the effect of the vaccine cannot be judged accurately. In pulmonary tuberculosis it is not fair to use as a test cases in which the general health has suffered seriously because of extensive destruction of lung tissue; only more or less fresh cases with marked signs of activity of the process, such as fever, night sweats, and emaciation, and so far as possible with the presence of tubercle bacilli in the sputum, should be employed. Incipient cases also should be excluded as they sometimes become cured spontaneously.

Four cases of incipient and not very active pulmonary tuberculosis which were treated with the vaccine showed improvement or clinical recovery. In 4 very advanced cases early improvement was followed by death. Thirteen cases of severe but not

hopeless disease showed a decrease in the toxic symptoms and in most of them, even those in which the larynx was involved, there was also an objective improvement. In other cases the vaccine therapy failed entirely. Twelve patients with open, active, but not very far advanced tuberculosis improved rapidly and some of them completely recovered with disappearance of the tubercle bacilli.

In the author's opinion there is no longer any doubt as to the specific curative effect of the Friedmann vaccine. He regards the method as a decided advance in the treatment of tuberculosis. Further work must be done, however, to determine the exact manner in which it should be used and to settle certain questions such, for example, as its use in mixed infection. Laemmerhirt has never seen any injurious effects due to the vaccine. CREITE (Z).

#### BLOOD

**Stevens, F. A., Brady, J. W. S., and West, R.: The Relation between the Virulence of Streptococci and Haemolysin.** *J. Exper. M.*, 1921, xxiii, 223.

Since the original observations on streptolysin by Marmorek in 1902 there has been much discussion concerning the relationship between the haemolytic property and the pathogenicity of streptococci. Clinical and laboratory studies have been made, but because of the complexity of the problem the opinions arrived at have been contradictory. In 1914 the literature was reviewed by McLeod. McLeod believed that there is an intimate connection between haemolytic power and virulence, but stated that up to that time no solution of the problem had been generally accepted.

To attempt to solve the problem purely on a clinical basis was obviously impossible on account of the great variations in susceptibility of individuals to infection. This was undoubtedly the reason why observations depending on the course of any infection as an indication of pathogenicity led to such indefinite and opposed conclusions. If it were possible to establish definite facts in the laboratory under constant environment suitable for the growth of the bacteria it is probable that the same methods might be applied to the clinical phase of the problem.

According to McLeod, the ideal laboratory experiment would consist in testing the haemolytic power of the streptococcus *in vivo*. However, as there are no trustworthy methods by which this can be accurately carried out, the obvious alternative consists in observing the haemolytic titer of virulent strains in the serum of the animal for which they are pathogenic. The authors attempted to use rabbits in this manner but had great difficulty in obtaining strains of cocci which were of constant virulence, and found that the haemolytic titers of cultures growing in rabbit serum varied considerably. Because of these difficulties they attempted first to determine the relation between pathogenic and non-pathogenic strains in respect to haemolytic power when they were grown in the serum of an



animal for which their virulence had not been especially increased.

The character of the media employed was undoubtedly the most important essential for the production of strong hæmolysin. Beef infusion broth to which horse serum was added to 20 per cent of the volume was found to be the most satisfactory for the comparison of various strains. When the broth was made with 2 per cent peptone the titers were quite constant in different experiments with the same streptococcus. To insure uniformity all the media used in this series were made at the same time from the same lot of beef infusion. They were titrated so that the pH was 7.6 after sterilization, and were distributed in quantities of 80 c.cm. in 250 c.cm. pyrex flasks. The horse serum was obtained from the same animal in each instance. While it was still fresh, 20 c.cm. were added to each flask. The contents of the flasks were then inactivated at 56 degrees C. on three successive days and then stored on ice until used. In this way it was possible to grow the cultures under conditions in which available protein substances and the anti-hæmolysins were constant.

Five strains of the beta type of streptococci obtained from acute human infections, in some instances from the blood stream and in others from pleural exudates, were used. They conformed to the streptococcus pyogenes of Holman and gave a final hydrogen-ion concentration of pH 4.9 to 5.2 in glucose broth. Before these strains were used for the authors' experiments they were stored on blood agar and transplanted at frequent intervals during a period of several months in order that they might lose their original virulence for animals.

At the beginning of the experimental work the invasive power of each strain was determined on mice of approximately the same weight. They were then passed through mice by intraperitoneal injection and obtained in pure culture from the heart's blood. The doses were regulated so that the animals died within twenty-four hours. After each passage the strain was transferred to rabbit blood agar in the second subculture. When each streptococcus was sufficiently invasive, the avirulent and virulent forms were transplanted from the blood-agar tubes into horse-serum broth and then, after an interval of fourteen to eighteen hours, the trial flasks of bouillon were seeded with the necessary quantities of these cultures. In this way the streptolysin production was determined with actively growing cocci which were accustomed to the media in which the test was made. After the hæmolysin tests, the virulence of the streptococci was again determined on mice with the corresponding subcultures from the stock media. Several experiments were performed, the results of which are given by the authors in a series of tables and charts and summarized as follows:

Strains of streptococci whose virulence had been increased for any one species of animal did not produce greater concentrations of hæmolysin than the original strain. Furthermore, the original culture

showed a tendency to grow more rapidly than the more pathogenic form, and to reach the height of hæmolysin production at an earlier stage during the growth of the culture. These conclusions apply only to experiments in which the serum used in the media was from a species not employed for the animal passages.

G. E. BELLBY.

**Szenes, A.: The Effect of Thromboplastic Substances on Blood Clotting** (Ueber die Beeinflussbarkeit der Blutgerinnung durch thromboplastisch-wirkende Substanzen). *Mitt. a. d. Grenzgeb. d. Med. u. Chir.*, 1920, xxxii, 627.

This question was tested by the most accurate method of determining blood clotting, the original Wright method. The author reports the effect on the human organism of injections of salt, extracts of organs, and calcium.

The effect of hypertonic salt solution on blood clotting is shown in the form of a wave-like curve. Clotting is at first delayed and then hastened, the second phase lasting longer than the first. Expressed extract of thyroid in doses as high as 40 c.cm. was injected under the breast and followed immediately by intravenous injections of 10 per cent salt solution. In persons with normal blood this combined method decreased the clotting time below that noted when salt solution was used alone. In persons with diseases of the blood there was a relatively slight reaction to the combined injection. A distinctly toxic effect was observed in a full-blooded, healthy young man with a traumatic effusion of the knee joint.

Lung extracts of young rabbits caused a hastening of the clotting time. The effect, however, was not as great as that of the human thyroid extract and much more painful. Extract of testicle had no effect, possibly because the amount used was small. Experiments with intramuscular injections of calcium gelatine were given up because they were so painful and because they had almost no effect on the clotting time.

Following the intravenous injection of calcium no initial delay in clotting was observed; it seems to have been present but passed very quickly.

After a few minutes there was increased rapidity of clotting which did not reach its maximum until after several hours. Because of this long duration of its effect on the clotting time, the intravenous injection of calcium is superior to any of the other methods used. Occasionally, however, even this fails.

COLLEY (Z).

#### BLOOD AND LYMPH VESSELS

**Gradenigo, G.: Ligation of the Jugular Vein in Otitic Pyæmia** (Sulla legatura della giugulare nella piemia otitica). *Riforma med.*, 1921, xxxvii, 126.

Ligation of the jugular vein has been advocated as a measure directed against the penetration of infecting organisms into the circulation, but otolo-



gists are divided in their opinion regarding the curative value and the dangers of the procedure. Statistics show that in otitic infections simple sinus operations are as frequently followed by recovery as ligation of the jugular.

In the case of a youth 20 years of age who had acute purulent otitis media on the left side following tonsillitis the affection assumed the aspect of a particularly severe osteomyelitis of the temporal bone. Despite a wide intervention on the mastoid, the disease took a typical pyæmic course which was not modified by an exploratory operation on the sinus. In this operation the sinus was found pervious and without thrombus. On the second day the author ligated the jugular vein. The infective process was immediately arrested and an easy convalescence followed with complete recovery.

The author states that this case demonstrates the efficacy of jugular ligation in otitic pyæmia not complicated by infective thrombosis of the sinus. No complication in the venous circulation of the head need be feared; repeated ophthalmoscopic examinations did not reveal any modifications in the vascular conditions of the fundus oculi on the affected side as compared with the other eye. W. A. BRENNAN.

**Hare, H. A.: The Treatment of Aortic Aneurism by Wiring and Electrolysis: A Further Report.** *J. Am. M. Ass.*, 1921, lxxvi, 587.

Hare has previously reported a considerable number of cases of sacculated aneurism of the aorta treated by wiring and electrolysis. Since then, three others have been successfully treated in this way. The second case was so advanced when the patient came under observation that anything more than palliation and brief prolongation of life was not to be expected.

One of the most important effects of the operation is the relief of pain. This is usually immediate.

E. C. ROBITSHEK.

**Klapp: The Treatment of Varices by Percutaneous Ligation** (Ueber Varicenbehandlung mit vielen percutanen Umstechungen und ueber Varicenbehandlung). *Deutsche med. Wchnschr.*, 1921, xlvii, 9.

The ligation described may be done under general or lumbar anæsthesia, the leg being elevated or suspended in a sling. Before the leg is elevated the varices are marked with starch solution after being painted with weak tincture of iodine. They are then painted with iodine again. Subcutaneous ligations with catgut are made with a needle. Between 40 and 50 ligatures are generally sufficient.

If the granulations are clean, Klapp uses this method even when there are open ulcers, but the sutures should not be applied very near an ulcer. The course of recovery is extraordinarily painless. In varicocele Klapp seizes every tortuous vein with a Kocher forceps, draws it to one side, and ties it off. The testicle is raised by shortening the cremaster muscle, which is also isolated and tied off.

COLMERS (Z).

**Schultze, E. O. P.: A New Method of Operating on Varicose Veins** (Ueber eine neue Methode der Varicenoperation). *Zentralbl. f. Chir.*, 1920, xlvii 1482.

After ligating the saphenous vein at the usual point in the ankle, a continuous suture is begun with iodized catgut and carried upward in spiral turns, the individual sutures being placed close together where they catch the veins and the spiral turns being about three finger-breadths from each other. A centimeter and a half above the first series of sutures a second series is begun. The individual sutures are drawn tightly and reach down to the fascia. If the vein bleeds, another suture is passed entirely around it. The sutures are continued upward to at least a hand's breadth above the last varicosity. The stitches are left in until they are absorbed. The patient is kept in bed for two weeks.

RAESCHKE (Z).

### GENERAL BACTERIAL INFECTIONS

**Klose, F.: The Etiology and Specific Treatment of Gas Œdema** (Ueber die Aetiologie und spezifische Behandlung der Gasödemerkrankung). *Ergebn. d. Hyg., Bakteriöl., Immunitätsforsch. u. exp. Therap.*, 1920, iv, 1.

Malignant œdema and gas phlegmon show transition stages and the same causative agent both clinically and in pathological anatomy. The clinical course depends not only on the degree of virulence of the bacteria, but also on the specific action of several kinds of anaerobes, the different types producing gradual transition stages from gas phlegmon to malignant œdema.

It is generally known that there are many types of bacilli which produce gas œdema. These may be classified into three groups: (1) the group of non-motile butyric acid bacilli (the pathogenic member of the group is the Welch-Fraenkel gas bacillus); (2) the group of motile butyric acid bacilli; and (3) the group of motile putrefying bacilli.

The clinical diagnosis cannot yet be made by bacteriological and serological methods. The positive finding of pathogenic strains of gas bacilli is not decisive as most gunshot wounds show anaerobic infection though not more than from 1 to 3 per cent of them develop gas œdema. A bacteriological diagnosis cannot be made for several days and then it is too late for treatment.

The chief therapeutic measures are the surgical cleansing of the wound and the removal of foreign bodies. Conradi and Bieling recommend the use of anthrax vaccine No. 1 made by the Hoechst Company for the treatment of gas œdema in man. This may fail in some cases as it is made with only one type of bacillus. The serum made by Aschoff and Klose is polyvalent and contains all three groups; it is obtained by the immunization of horses and is a bactericidal and antitoxic serum.

The use of this serum must be prophylactic. A prophylactic dose of 20 c.cm. should be injected



intramuscularly in the buttock or breast as soon as the patient arrives at the dressing station. The protective effect is increased when, within the first three days, especially if the patient is transported or the dressings are changed or an operation is performed, several doses of the serum of 10 c.cm. each are given. The serum may be useful therapeutically in connection with surgical procedures. From 20 to 60 c.cm. or even as much as 150 c.cm. may be given intramuscularly and repeated for the first few days. KLOSE (Z).

**Klug, W. J.: The Bacterial Flora of Wounds** (Zur Wundbakterienflora). *Deutsche med. Wchnschr.*, 1921, xlvii, 14.

The author reports a case in which, after operation for gangrenous appendicitis, Plaut-Vincent bacteria were found in the wound. The course of the case was complicated by a bilateral thrombosis of the saphenous vein and pneumonia. The granulating wound showed nothing characteristic of Plaut-Vincent bacteria except that the granulations were very sensitive and showed no tendency to produce epithelium.

These fusiform and spirochæte infections may have arisen from secondary infection of the wound, or the appendicitis may have been due to such an infection originally. In man, both these forms of bacteria appear in the mouth and intestine, and cases of appendicitis attributed to them have been described in the literature.

In the case reported the patient had filled and carious teeth. These are favorite locations for the bacteria described, and therefore it is probable that the appendicitis was caused by them and that the abdominal wound was infected during the removal of the gangrenous appendix. In cases of appendix wounds which do not heal readily examination should be made for these bacteria. VORSCHUETZ (Z).

**Olitsky, P. K., and Gates, F. L.: Experimental Studies of the Nasopharyngeal Secretions from Influenza Patients. I. Transmission Experiments with Nasopharyngeal Washings.** *J. Exper. M.*, 1921, xxxiii, 125.

In planning the experiments reported the authors had in mind the possible presence in the nasopharynx of persons suffering from acute epidemic influenza of some agent which might have an effect on animals. In considering the criteria of activity of this agent they thought first of the well-known phenomenon in man of leucocytic depression involving especially the mononuclear cells during the acute influenzal attack, and next, of the more or less pronounced but possible transient changes in the lungs which conceivably might predispose to the severe pneumonias often accompanying the attack of influenza as a secondary or concurrent infection.

This study was made during the course of over one and one-half years in three successive periods. In the first period, which coincided with the epidemic wave of 1918-19, cases of acute uncomplicated in-

fluenza and persons who had never been affected were studied. The second period included the late autumn of 1919, during which influenza did not prevail in New York in epidemic form. During this interepidemic period normal persons were studied as controls. The third period was the winter of 1920, in which the epidemic returned. At this time additional cases of the disease were available for investigation. By proceeding in this manner the authors hoped to check the results for each period against the others. They believe that they succeeded in this undertaking, and therefore present their findings with more or less confidence.

The outstanding difficulty in the choice of subjects to be employed arose from the necessity of selecting, on the one hand, cases of undoubted acute influenza, and, on the other hand, perfectly healthy persons who had never suffered from the disease. In the end the second requirement was more easily fulfilled as the circumstances of the undertaking made possible a leisurely and painstaking choice of subjects. When uncomplicated influenza was studied, however, it was necessary to choose the subject at once as the epidemic wave of the disease was notably brief, being prolonged chiefly by secondary respiratory infections.

The criteria which were used as guides in the selection of cases of influenza were abrupt onset of the condition with chilliness, fever and prostration, and headache associated with muscular pain, especially in the back and limbs. Among the early symptoms were flush and suffusion of the face, injection of the conjunctiva, soreness of the throat, and a harsh, unproductive cough. In the early stages no physical signs were detected in the chest, gastrointestinal symptoms were inconspicuous, and disturbances referable to other internal organs were not complained of or detected by physical examination.

These symptoms, although striking, were rarely such as could be measured accurately. However, there was one sign of quantitative value, namely, the leucocyte picture. Uncomplicated influenza showed a pronounced leucopenia affecting the absolute number of mononuclear cells, chiefly of the lymphocytic variety. This was persistent and even resisted at times secondary infectious processes, e.g., pneumonia in which leucocytosis was the rule. Great reliance was placed on this quantitative sign. The symptoms and effects persisted for from one to three days. Convalescence, initiated by a lysis fall of temperature, then set in, and recovery promptly followed.

Saline washings from the nose and throat were studied. These were obtained from 8 cases of influenza within the first thirty-six hours of the disease, and from 12 cases at later stages, including the period of convalescence or the period of post-influenzal pneumonia. In addition, 14 persons who had not been affected were tested during the epidemic or interepidemic period.

In earlier experiments on animals the authors employed rhesus monkeys. These were found to be



unsatisfactory, however, as they are scarce in this country and frequently suffer from pulmonary lesions of a tubercular or other type. The experiments required animals more readily available and free from respiratory affections of any nature. Therefore in the later investigations rabbits were used.

An active substance was detected by the methods described in 5 patients in the early stages of epidemic influenza during 1918-19 and in 2 patients in the early stages of epidemic influenza during 1920. It was not detected in 12 cases of the same disease in which the onset of obvious symptoms occurred more than thirty-six hours before the washing of the nasopharynx was carried out or in the secretions of 14 persons free from the syndrome of influenza either during the epidemics or in the interval between them.

By means of this substance a clinical and pathological condition was induced in rabbits which affected the blood and pulmonary structures mainly, and which was maintained and carried through at least 15 successive animals. For this reason, and also because of the dilution between the passages, the authors were led to believe that they were dealing with the actual transmission of a multiplying agent rather than a passive transference of an originally active substance.

In some of the experiments secondary infections due to ordinary bacteria were encountered. The relation of these micro-organisms to this active substance will be dealt with in a future paper. The essential effects were produced by a substance wholly unrelated to these bacteria.

The similarity between the effects produced on the blood and lungs of rabbits and those occurring in man in epidemic influenza suggested a subject for further investigation on the inciting agent of epidemic influenza.

G. E. BEILBY.

#### SURGICAL DIAGNOSIS, PATHOLOGY, AND THERAPEUTICS

**Ahlswede, E.: Digestion of Keloids, Cicatrices, and Buboos with Pepsin-Hydrochloric Acid.** *Arch. Dermat. & Syph.*, 1921, iii, 142.

The latest histologic experiments of Unna have proved that the digestive power of pepsin and hydrochloric acid combined penetrates the horny layer of the epidermis and that this combination may be used for carrying other chemical agents through the horny layer.

Experiments were first made on keloids and scarring due to burns to test the possibility of digesting the fibrous (collagenous) tissue which is the chief element in these scars. The following solution was used: pepsin, 10 c.cm.; muriatic acid, 1 c.cm.; phenol, 1 c.cm.; distilled water to make 200 c.cm. Phenol was added to prevent possible putrefaction of the decaying tissue. Compresses of absorbent cotton soaked in the digestive solution were applied and then covered with an impermeable cover.

The cosmetic effect on scarring due to burns was excellent. In many cases of fresh scars no trace was left after a systematic application of the method.

These successes led to the local treatment of *ulcus durum*, a reaction of the organism against *spirochaeta pallida* consisting chiefly of hypertrophy of the fibrous tissue surrounding the blood vessels. The induration was digested by similar compresses with pepsin-hydrochloric acid.

Cases of adenitis caused by different infections, such as buboes following soft chancre, were also treated in the same manner and with uniform success.

In the treatment of tuberculous glands in children pepsin compresses represent a good substitute for surgical treatment. The incision of tuberculous glands is not always free from risk as more than one case of lupus has had its origin in this procedure.

M. I. MALONEY.

**Bartlett, W.: Painless Hypodermoclysis.** *Ann. Surg.*, 1921, lxxiii, 161.

The vicarious administration of water has been revolutionized in Bartlett's clinic by the employment of local anaesthesia from the beginning to the end of the procedure. Extensive use of infiltration anaesthesia suggested the substitution of very dilute novocaine in place of plain salt solution or distilled water. In the evolution of this method Bartlett gave by hypodermoclysis gradually increasing amounts of fluids in which from time to time the quantity of novocaine was cut down first from one-half to one-quarter, then to one-eighth, and finally to one-sixteenth of 1 per cent without appreciable effect upon its anaesthetic action. It was but a further step in the technique to add sterile morphine to the hypodermoclysis fluid. The dosage is to be determined by the rapidity of inflow, the patient's age and condition, and all the other elements which must be considered ordinarily in the employment of this drug.

When hypodermoclysis is used in a condition attended by a fall of blood pressure, such as shock or haemorrhage, adrenalin is added to the fluid.

The use of freshly distilled water instead of salt solution was begun in 1915, but the author is not sure that sterile water, which is not an isotonic substance, can always be employed without undesirable local effects. On some occasions its use has been followed by tissue changes. These, however, are noted also when salt solution is injected.

The apparatus used consists of the ordinary 700-c.cm. glass drip bottle, a rubber tube 1 yd. long controlled by a screw clamp, and a long, slender needle. The inflow is regulated according to the rate of absorption, the water-logged area never being allowed to become unreasonably tight as this would result in pressure necrosis. In some cases the needle may become plugged and it is necessary to withdraw it and clean it with a wire.

The flank midway between the lower ribs and the prominent upper curve of the ilium is the site of



election for the injection since less subsequent damage has occurred here than elsewhere. The introduction of the needle is made painless by spraying the skin with ethyl chloride. After the needle has been introduced the region is covered with a small square of gauze held in place with adhesive.

In some few instances the ordinary sight drip apparatus has been employed, 40 to 80 drops being introduced per minute, but any form of graduated clamp may be used.

Hypodermoclysis has given the author greater satisfaction than any other method of introducing fluids vicariously. It is not ideal, however, nor is any other procedure but drinking. In most cases a continuous inflow of  $\frac{1}{2}$  per cent novocaine can be maintained as long as indicated without causing discomfort or toxic symptoms. M. I. MALONEY.

#### ROENTGENOLOGY AND RADIUM THERAPY

**Stevens, J. T.: The Management of Toxic Goiter with Radiation.** *N. York M. J.*, 1921, cxlii, 247.

The author believes that in properly selected cases radiation with radium or the roentgen rays is the best method of treating toxic goiter. He prefers the roentgen rays because they can be produced in unlimited quantities at a comparatively low cost and of a quality closely approximating that of the gamma rays of radium. Radium is of advantage in that it is portable and easier to apply, and the technique of its use is less tedious. The treatment should be carried out with the co-operation of a good internist and the results should be controlled by basal metabolism tests. In this way the danger of over-radiation and the possible production of hyperthyroidism may be avoided. If hyperplasia of the thymus is present, this gland also should be radiated.

As regards the roentgen technique used, usually four fields or areas will be sufficient, the diseased area being crossfired from each. The machine is set so that it will back up the equivalent of 90,000 volts. A 6 mm. filter is used, and a focal distance of 10 in. To each area or port of entry about 75 milliamperes minutes are administered according to the value of the particular machine used. The series is repeated at monthly intervals. The interval between treatments is lengthened as soon as the patient begins to gain weight, the pulse begins to slow down and becomes more regular, and the nervous symptoms decrease.

In the severe cases it is not unusual for the patient to be more toxic in from one week to ten days following the first series of treatments. For this reason in severe cases it is advisable to begin by carefully increasing the milliamperes minutes gradually. This stage is fortunately followed in a short time by complete or marked relief from the symptoms of hyperthyroidism. The tumor may decrease in size somewhat following the first series of treatments, but generally further radiation is necessary before much change is noted. It is not uncommon

for a goiter the size of a grapefruit to reach the size of a robin's egg following from four to five series of treatments, the patient in the meanwhile enjoying perfect health.

In conclusion the author states that metabolism tests show that at least 90 per cent of the toxic goiters can be cured by proper roentgen therapy. Radiation properly carried out is at present the method of choice in many of the medical centers throughout the world. It does not disfigure the patient for life, it is decidedly less dangerous than other methods and the results are at least as good as those obtained by other procedures, if not better. Many of the patients referred for radiation are those who are too ill to withstand operations and those that have had operative failures. The results obtained in these cases serve only to prove that in properly selected cases radiation is the best method. ADOLPH HARTUNG.

**Quick, D.: The Combination of Radium and the X-Ray in Certain Types of Carcinoma of the Breast.** *Surg., Gynec. & Obst.*, 1921, xxxii, 156.

The author and many others have found that much benefit may be obtained from the use of the roentgen ray in breast cancer. Radium also exerts a marked influence on this condition both when applied externally and when embedded in the growth. It is striking to note in the literature that, in general, the workers in the two fields have kept distinctly apart and only more recently has any effort been made to combine the two therapeutic agents.

During the past two years at the Memorial Hospital both agents have been used in cases of breast cancer when it was believed that the peculiar features of each were best adapted for the treatment of certain parts of the growth. While the use of radium over localized recurrent nodules and the use of the roentgen ray over the regional areas has been of distinct advantage, it was not in such cases that the combination was of most value.

In all cases of localized bulky tumors, whether they were recurrences, lymphatic metastases, or primary inoperable growths, radium emanation was embedded in the substance of the growth in such a manner as to give a uniform, diffuse radiation throughout, especially in the deeper portion of the mass where the roentgen-ray effect was least. Fine glass capillary tubes, approximately 3 by 0.5 mm. in size, containing radium emanation were prepared in the physical laboratory for this purpose. Each tube contained from 1 to 3 mc. of emanation but a maximum of 2 mc. was considered best. Under local anesthesia and the observance of all precautions of surgical technique, these tubes were inserted through fine trocar needles throughout the substance of the tumor in such number and strength as to give a uniform effect without causing gross necrosis of tissue. No open wound was left as an avenue of infection as the trocar needles were no larger than a medium-sized record syringe needle. The tubes were left in place permanently and be-



came encapsulated by fibrous tissue. The emanation decreased in strength at a definite rate, and as its strength at the time of its insertion was known, it was possible to calculate the exact total dosage to be derived from each tube.

The prolonged radiation thus obtained, extending over a period of several weeks, appeared to be more beneficial than the same total dosage delivered in a few hours. There was no filtration other than that afforded by the thin glass, and therefore practically all of the beta radiation was utilized. This was probably the most valuable feature of the interstitial application of radium.

The tubes were always inserted through intact skin and care was taken to avoid necrotic infected areas of tumor tissue so that infection would not be spread to the deeper parts of the neoplasm and aid in the breaking-down process. The emanation embedded in this manner takes care of the deeper part of the neoplasm and in no way interferes with the application of the roentgen ray to the surface.

Unless there was some very definite reason to the contrary, every patient was then given roentgen-ray treatment in massive doses over the entire local and regional surface. The skin over the breast region and all regional lymphatic areas was divided into multiple portals, and massive doses of heavily filtered roentgen rays were delivered at cross-fire. In other words, the roentgen-ray treatment was made as thorough as though radium were not used. Increased intensity of the skin reaction was prevented by allowing for the different time factor in the oncoming reaction of the roentgen ray and the radium, and varying the roentgen-ray exposure over the local area to meet this properly.

A few cases are cited as examples of types lending themselves best to treatment in the manner described. In all, 78 patients were thus treated. Of this number, 7 have shown complete regression in the treated areas and up to the present time have remained clinically free from disease for periods ranging from three months to more than two years. Twenty-one patients have shown partial regression which is still progressing, but are not as yet clinically cured. Many patients have received temporary benefit only. In 10 cases there was no improvement from the treatment, but in all of these the disease was not only far advanced locally but disseminated widely throughout the body.

Fifty-seven of the growths treated were recurrent or metastatic tumors, while 21 were primary. With the exception of 1, they were all inoperable tumors. Of the 20 other patients, 1 has been clinically free from disease for six months, 8 are still showing continued regression, the condition of 5 has been improved temporarily, 2 have been lost sight of, and the condition of 1 is unimproved. Three who were treated during the past four months are progressing favorably.

The results from the combined use of the roentgen ray and radium in breast cancer up to the present time have led the author to the following conclusions:

1. The roentgen ray occupies a place in the treatment of every case of carcinoma of the breast.

2. In certain cases radium may be used to considerable advantage in combination with the roentgen ray.

3. The cases in which radium proves valuable in this combination are mainly: (1) localized flat recurrences where surface applications can be made directly over the lesion, (2) bulky recurrences where radium emanation can be embedded directly into the tumor, (3) cases of axillary involvement which are always difficult to influence favorably with the roentgen ray alone and in which radium emanation can be embedded in the neoplasm or in the axillary fat tissue so as to give a diffuse radiation of the axillary space from within, (4) inoperable primary growths where embedded emanation can be utilized to radiate the tumor from within, as well as the axilla and even the supraclavicular space in the same way, if necessary, (5) primary cases in which operation is refused and treatment may be carried out much in the same way as in the inoperable primary cases.

4. In some instances the combination of radium and the roentgen ray may change an inoperable case into an operable case. ADOLPH HARTUNG.

**Lewis, R. T.: The Disappearance of a Mediastinal Neoplasm under X-Ray and Radium Treatment.** *Proc. Roy. Soc. Med., Lond., 1921, xiv, Clin. Sect., 22.*

This article reports a case of sarcoma involving the cervical and axillary lymph glands, the mediastinum, and the left lung. On four separate occasions the glands disappeared under the influence of roentgen and radium therapy and there was retrogression of the growth in the chest. Ultimately, however, there was another recurrence from which the patient died. ADOLPH HARTUNG.

**Alvarez, W. C.: Peristalsis in Health and Disease.** *Am. J. Roentgenol., 1921, n.s. viii, 1.*

This article deals largely with the physiological aspects of peristalsis and the underlying factors regulating it in health and disease. The first theory presented is that the forces which bring about, modify, and control peristalsis must be looked for mainly within the walls of the gut itself. Active peristalsis may be obtained in small segments of gut and in pieces of muscle stripped from the wall. The gastro-intestinal tract is autonomous and the rhythmic contractions are of a myogenic nature. The nerves within the gut wall as well as those leading to and from it serve largely as conductors. The first carry stimuli from adjacent structures and serve to co-ordinate the activities of different parts; the others serve to communicate between the body and the bowel and between the bowel and the brain.

The key to an understanding of peristalsis is to be found in a study of the smooth muscle in the wall of the bowel. In the different parts of the body and in different parts of the digestive tract are different



types of muscles suited to different functions. The properties of smooth muscle are discussed; its reaction to stimulation, distention, inflammation, etc. If smooth muscle in a tubular organ like the intestine is stimulated, a contraction is obtained which produces a tonic ring. From this ring waves are given off in both directions. The stimulus probably increases the chemical activity at the point where the tonus ring forms; it raises the metabolic rate and stimuli spread out on both sides down gradients of chemical activity. The direction in which material in a tubular organ is transported depends on gradients of rhythm, tone, irritability, and metabolism.

Regarding the existence of gradients in the gastrointestinal tract, many experimentally proven facts are cited to demonstrate that the rate of rhythmic contraction of the smooth muscle is greater at the cardiac end of the stomach than at the pyloric end and greater at the duodenum than in the lower ileum. These varying rates are probably dependent upon the rate at which the chemical processes go on within the muscle.

In following the course of an opaque meal, the barium is seen to shoot rapidly through the first part of the œsophagus because the muscle is quick-acting and striated. In the lower third the muscle is largely of the smooth variety and progress slows up. In the stomach the waves begin probably in the pacemaking region near the cardia and travel as shallow ripples until either proper conditions of pressure or the presence of the peculiar antral muscle causes them to break into deep waves. If the tone of the stomach is too high, the waves may be very shallow or difficult to see; if the tone is poor, we may see the best waves at the beginning of the examination when a little food is present and the muscle fibers are not too badly stretched.

The waves do not cross the pylorus, probably because of the connective-tissue barrier there, the peculiar arrangement of the muscle fibers, and the sudden transition to a different type of muscle. The duodenal cap remains filled and shows almost no peristalsis, probably because the muscle removed from that region shows very little rhythm. There is some evidence that the muscle fibers are arranged in festoons and not circularly and longitudinally as they are elsewhere. This might tend also to modify the contractions.

Because of its great irritability and rapid peristaltic rate, the jejunum does not become filled. The food slows up in the terminal ileum because the muscle is more sluggish and the gradient is uphill for a short distance to the ileocecal sphincter. In the first third of the colon the gradient is poor, so that the waves may go in either direction. The colonic contents move slowly because the muscle is more sluggish and perhaps because the gradient is poor.

The assumption that a gradient underlies peristalsis easily explains many of the phenomena observed in disease. The gradient of forces may be

steepened, flattened, or reversed. A duodenal ulcer which raises the irritability and tone of the upper end of the tract often hurries the progress of food through the small intestine; a lesion in the appendix or cæcum which raises the irritability of the lower end of the bowel slows the current and produces ileal stasis. A fissure in the rectum may cause back pressure into the cæcum with constipation. A patch of enteritis in the jejunum may reverse the current above, in the duodenum and stomach, causing vomiting, and may hurry it below, causing diarrhœa. A stimulus reaching the jejunum from the brain by way of the vagi—as in sea-sickness—may also empty the tract in both directions. The distention of any part of the tract by food raises the tone and irritability of that region and tends to hold back the material which is coming down from above.

When confronted by an abnormality in intestinal peristalsis it is well to remember that if the lesion is sufficiently irritating it will raise the local tone; this will reverse the gradient leading to the lesion on the oral side and will steepen the gradient on the caudad side. Hence it may slow, stop, or reverse the progress of material coming toward it from above and hasten the progress of material that has passed it. Exceptions to this rule will be found around the stomach where there are many complicating factors not sufficiently understood at present.

ADOLPH HARTUNG.

### MILITARY SURGERY

Gray, H. M. W.: *An Address on the Application of the Professional Lessons of the War to Civil Work.* *Brit. M. J.*, 1921, i, 109.

The problems of treatment, both preventive and curative, are virtually the same for the civilian and the soldier and differ only in the urgency of their appeal to our sentiments and best efforts.

When a man in the army failed to keep pace with the standard set by other men in a similar position he was replaced by a more able man. This rule should be in force in our teaching institutions and in our hospitals.

Better teaching facilities should be afforded. This will be done in Aberdeen where the plans include a concentration of the city hospitals in one large compound, the transference of certain departments of the university to the same site, and provision for the housing of senior students so that they may be able to take advantage of all emergency work.

One of the important developments of the war was team work. The advantages of this were demonstrated at the Mayo Clinic in America before the war. Collaboration is necessary between the hospital surgeon and the general practitioner.

The lessons taught by the war in the early handling and transport of patients who are seriously ill should be applied in civil life. The realization of the importance of these details in the army resulted in



the saving of thousands of lives and limbs and greatly decreased suffering. Lives are lost unnecessarily, even in the biggest cities, from the effects of shock and primary hæmorrhage, and from other causes due to the lack of better organized effort. Factories and industrial centers should provide means for emergency first-aid treatment as was done in the army.

In spite of the enormous numbers of patients, waiting lists were not in vogue in the army. The large waiting lists of the civilian hospitals, however, are regarded with comparative equanimity. The same attitude is apparent in epidemics when lives are lost because of the fact that skilled nursing under suitable conditions is not available in adequate amount. Very often under conditions of stress too much time is spent by surgeons on patients who require extensive and prolonged operations with a low rate of recovery. As a result the treatment of other patients who, with timely intervention, would recover more rapidly and in far greater proportions, is delayed for a day or two and when it is begun the infection has often spread, more extensive measures are necessary, and the convalescence is prolonged.

The outstanding surgical lessons of the war are listed as:

1. The treatment of infected wounds by excision of the infected and devitalized tissue, followed sometimes by primary suture.
2. The treatment of severe wounds of the chest. Early in the war practically all patients with severe thoracic wounds died. In the last year of the war the best surgeons were operating in these cases so successfully that there was every indication that approximately 70 per cent would again become useful citizens.
3. The striking effect of the proper treatment of fractures. The early high mortality was due to the effects of shock, hæmorrhage, and sepsis. By proper treatment this high mortality was greatly reduced. In this connection the use of the Thomas splint is highly recommended.
4. The utilization of transfusion of blood or its substitute in the treatment of shock and the effects of hæmorrhage.
5. The treatment of septic arthritis. Wilms, a Belgian surgeon, demonstrated that the only method of draining a joint adequately is to provide free drainage by means of ample incision. The patient should then move the joint spontaneously and vigorously to force the effusion out. This is contrary to previous teaching, but the results have justified the recommendation.

The same factor which is involved in the use of active movements in joint sepsis is found in cases which recover after operation for peritonitis or pleuritis. In these, normal movements of the bowel or lung occur speedily, and it is better to dispense with drainage. Drainage is indicated if there is paralysis of peristalsis or if the lung does not expand, but even when drainage is provided recovery

is very doubtful. The less expert the operator, the greater the necessity for drainage.

There are two instances of development of work at home. One was the enormous progress made by many orthopedic surgeons in bone grafting, nerve suture, etc.; the other, the organization of the treatment of amputation stumps. Special centers have been organized to provide proper treatment of stumps and skilled attention in the fitting of artificial limbs. At least some of these centers should be preserved as there are 40,000 persons in the British Isles who lost one or more limbs before the war.

C. F. ANDREWS.

**Barcroft, J.: Anoxæmia as a Factor in Acute Gas Poisoning. *J. Roy. Army Med. Corps, Lond., 1921, xxxvi, 1.***

Anoxæmia includes all those conditions in which the tissues of the body are starved, or partially starved, for oxygen. It is ordinarily divisible into three main types:

1. That in which the pressure of oxygen in the blood is too low. This is known as the "anoxic" type. There is sufficient blood and sufficient hæmoglobin in the blood, but the hæmoglobin is in part reduced. The blood in the arteries presents the general appearance of venous blood, and insofar as it is venous the condition is anoxic anoxæmia.
2. That in which there is too little hæmoglobin in the blood. The pressure of oxygen is normal, the functioning hæmoglobin is saturated with oxygen and bright red like normal arterial blood, the volume of blood which circulates is adequate, but in each cubic centimeter of blood there is a deficient quantity of functioning hæmoglobin. This second type of anoxæmia may be called the "anæmic" type. Ordinary anæmia is the most obvious example.
3. The stagnant type of anoxæmia. The blood is normal in quantity, but is delivered to the tissues in insufficient quantity, and therefore the amount of oxygen which reaches them per minute is too small.

Three different types of treatment have been suggested: (1) bleeding and infusion of saline, (2) oxygen treatment, and (3) rest and warmth.

Infusion seems to combat the stagnant type of anoxæmia by restoring the volume of the blood and re-establishing the blood pressure. The aim in such treatment is to secure the circulation of an adequate supply of hæmoglobin throughout the tissues.

Oxygen treatment combats the anoxic type of anoxæmia directly, and therefore if given early wards off: (1) the loss of power of the respiratory center, which would lead to an even more profound anoxic condition; and (2) the onset of the stagnant type caused by heart failure.

Rest, which reduces the oxygen requirements of the body to a minimum and thus reduces also the anoxicity, prevents sudden vagus stimulation of the



heart and the necessity for rapid vasomotor accommodation.

These three lines of treatment, touching as they do different phases of anoxæmia, are not interchangeable. Ideally they should all be prescribed; in practice, however, the ideal can only be aimed at.

M. I. MALONEY.

**Chislett, C. G. A.: The Effects of the Factors Producing Shell Shock.** *Glasgow M. J.*, 1921, n.s. xiii, 51.

The symptoms of war neuroses were mostly those of the ordinary "nervous breakdown." It depended to a great extent on the mental make-up of a soldier whether he was apt to develop shell shock or not. In the majority of cases lack of will power or instability is inherited, and careful inquiry into the patient's history in cases of war neuroses showed that in over 80 per cent there was a family history of nervous or mental disease, while in the cases in which the family history could not be obtained the presence of the physical stigmata of degeneration pointed to nervous instability or inherent mental weakness.

Certain attributes of the mind may become more highly developed by training and environment and compensate for a time for a lack in others. For instance, *esprit de corps*, an attribute ingrained in most regular soldiers and in many of the overseas troops, undoubtedly had the effect of postponing the development of the neurosis in those who were unstable. Fear and anxiety, the basic elements of war neuroses, are experienced by the normal man when brought face to face with modern warfare and he is fortunate if he can sublimate the external manifestations of these emotions. The genesis of neuroses was in some cases rapid, in others slow, and depended on the contributing forces.

As neuroses were comparatively unknown in previous wars in which open fighting was the rule, it is evident that they were favored by the trench warfare of the recent conflict. The unstable soldier did not develop marked symptoms during his early days in the trenches probably because of curiosity regarding new surroundings. The fear of consequences was thus kept in abeyance for a time. In open warfare the soldier was sustained in a similar manner indefinitely. Trench warfare gave the soldier ample time to exert his imagination, and if weakly balanced, he soon developed a state of mind in which any slight shock might be the determining factor in his nervous breakdown. In addition to the physical trauma of the nervous system, a state of neurasthenia was primarily present and the development of hysteria was the result of sudden shock on an unstable nervous system.

The greater responsibility devolving upon officers was a factor which made them more apt to become neurasthenics than the private soldiers.

In a few cases of neurasthenia, in which no hereditary taint of instability could be ascertained, the presence of bodily disease seemed to act as a

predisposing factor in the production of the neuroses. The influence of suggestion as a causative agent was felt more by young, untried soldiers.

As a general rule the symptoms in all cases were fairly well defined, but the differences in the psychogenetic factors were many. While the stress of war brought out that the main cause was fear in general, it was found that other factors were dreams and the fear of being buried alive which was very common with those living in dug-outs.

The symptoms indicative of the emotions of fear, such as tremors, tachycardia, pallor, etc., were the outward expressions of these emotions. Other signs, such as contractures and paralysis, were obscure in origin. Tremors were not always general. A man might have trembling of the lower limbs but no tremor of the fingers. Spasmodic movements and tics affecting whole groups of muscles were common and often could be referred to dodgings and efforts to escape passing missiles. There were also spasmodic movements which came to be known as the "dodging reflex," a lateral movement, and a "bobbing reflex," a ducking of the head. These probably had their origin in fear of injury to the eyes. Definite gaits were sometimes referable to movements performed immediately preceding the time of shock. "Camptocorme" or "bent back" usually resulted from a bruising or other slight injury at the lower part of the back. Contractures following slight wounds were apparently due to the patient's keeping the muscles immobilized as a reflex protection against pain, this immobility becoming exaggerated by meditation. Anæsthesia, analgesia, and hyperæsthesia were usually of late origin. Deafness apart from that due to organic lesions caused by windage was cortical. Blindness was comparatively rare. Occasionally this also came on after a period of meditation.

Mental states complicating the neuroses were varied. Maniacal symptoms with delusions and hallucinations were occasionally encountered. Mental depression was frequently associated with comotional shock and nearly always associated with neurasthenia. Neurasthenic patients kept at a base for a long period were apt to develop suicidal tendencies. Mental confusion and stupor were fairly common and generally associated with mutism. If the mutism could be cured by electrotherapy there was a general improvement in the mental symptoms. Disorders of memory gave rise to much trouble, both to the patient and to those responsible for his evacuation.

Periodic attacks of amnesia sometimes occurred, coming on even months later. The author does not know of any case of idiopathic epilepsy due to shell shock. In every case he observed there was a previous history of spasms. Hystero-epilepsy occurred in many cases as the result, not of the primary shock, but of imitation and suggestion. It also occasionally followed slight injuries to the head in soldiers who showed the taint of instability.

M. I. MALONEY.



## GYNECOLOGY

### UTERUS

**Grad, H.: A New Method of Subperitoneal Shortening of the Round Ligaments of the Uterus.**  
*Am. J. Obst. & Gynec.*, 1921, 1, 411.

Grad gives a summary of the operations that are done for retrodeviation of the uterus and then describes his new operation as follows:

The abdomen is opened by a subumbilical median or transverse incision. After the peritoneum is opened, the pelvis is cleared of intestines, cæcum, and sigmoid. Whatever intrapelvic work is necessary is completed first. Adhesions are broken up, the ovaries and tubes are inspected, and the fundus of the uterus is brought forward. A good exposure is essential and expedites the operation.

The round ligament on the right side at its midpoint is grasped with an Ellis clamp. Traction on the clamp puts the ligament on the stretch and in this way two sides of a triangle are formed. One side of the triangle is the round ligament from the grasp of the forceps to the internal ring of the inguinal canal where the ligament emerges, while the other side of the triangle is the ligament from the grasp of the forceps to its uterine end. At this step of the operation it is very essential to expose the under-surface of the abdominal wall where the round ligament emerges. This is readily accomplished by proper retraction.

Opposite the grasp of the forceps on the round ligament, and immediately below the edge of the ligament, the anterior layer of the broad ligament is picked up with a thumb forceps and nipped with the scissors. Beginning at this point with the scissors, the incision in the anterior layer of the broad ligament is extended along the edge of the round ligament until the internal ring of the inguinal canal is reached where the ligament emerges from the abdominal cavity. In this manner the entire round ligament is laid bare and divested of its peritoneum, and the two layers of the broad ligaments are separated.

Having divested the round ligament of its peritoneum and exposed the internal ring with the round ligament plainly in view as it leaves the abdomen, the operator takes a stitch of linen in the pillars of the ring, also picking up half of the round ligament as it enters the ring. A half tie is now made in the suture so as to anchor the ligament to the fibers of the ring at this point. With the same suture the round ligament is picked up mesial to its denuded area and from  $\frac{3}{4}$  to 1 in. from its uterine end, depending upon the laxity of the ligament, and the two points of the ligament are brought together by tying the linen suture. The uterine end of the ligament is now sutured to the pillars of the ring securely with two or three linen sutures so as to shorten the liga-

ment as much as desired. The redundant portion of the round ligament, which is also denuded, is now sutured under the anterior layer of the broad ligament and anchored in place with a linen stitch which is drawn through the anterior layer.

The anchoring of the round ligament to the fibers of the internal ring of the inguinal canal, the coaptation of the denuded portion of the ligament, and the burying of the superfluous portion are all accomplished with one linen suture in a very expeditious manner. The anterior leaf of the broad ligament, which has been cut away from the anterior surface of the round ligament, is now sutured with catgut to the posterior surface of the round ligament in such a manner as to cover all raw surfaces. The round ligament on the opposite side is shortened in the same manner.

Under certain conditions the subperitoneal shortening of the round ligaments is supplemented by two other operations, namely, an intraperitoneal ventro-suspension and a shortening of the uterosacral ligaments.

The intraperitoneal ventro-suspension differs from an ordinary ventro-suspension in that the two peritoneal surfaces to be brought into apposition are not traumatized. It is not intended that union shall occur between these two peritoneal surfaces. The purpose of the suturing is to hold the fundus of the uterus forward temporarily. The suturing is done with twenty-day chromic catgut. The needle enters the fascia in the midline and penetrates the fascia and the peritoneum from without about 1 in. from their incised edges. It then picks up the muscularis of the uterine fundus in the midline, penetrates the peritoneum from within outward, and emerges through the fascia about  $\frac{1}{4}$  in. distant from the point at which it entered. The suture is now tied, bringing the fundus of the uterus well under the peritoneum, away from its cut edge.

The uterosacral ligaments should be shortened whenever they are unduly relaxed, and also whenever there is the slightest degree of descensus of the cervix uteri.

The author gives a number of very complete charts based on a study of the end-results of the operation and draws the following conclusions:

1. Every case of retroversion of the uterus with symptoms requires abdominal section.
2. Subperitoneal shortening of the round ligaments of the uterus is an operation readily performed along definite surgical lines by a definite technique.
3. It is not a time-consuming operation, a very important consideration.
4. It creates no abnormal conditions in the pelvis or pelvic viscera.



5. It does not tunnel holes through the abdominal parietes.

6. It causes no intraperitoneal or intrapelvic complications.

7. It causes no complications during pregnancy or labor.

8. It is devoid of mortality or morbidity.

9. The final results show that 95 per cent are successful, a very creditable showing which compares well with that of any of the standard operations now in use for the treatment of retroversion of the uterus.

C. H. DAVIS.

**Rawls, R. M.: The Status of the Intra-Uterine Stem Pessary Based on a Study of 205 Cases with the End-Results in 117 Cases.** *Am. J. Obst. & Gynec.*, 1921, i, 499.

The intra-uterine stem pessary has been used for a little over a century. Numerous articles have been published setting forth its therapeutic value, but up to the present time its status is still undetermined. In a recent "Year-book on Gynecology and Obstetrics" there appeared an abstract of an article in which it was claimed that the stem pessary was of value in certain conditions. Immediately following, however, was a note by the editor stating that "the stem pessary is dangerous and of doubtful value in any condition."

From October 1, 1915, to September 30, 1919, there were treated in the Woman's Hospital in New York, 9,003 patients on whom were performed 15,823 operations. During this period 205 intra-uterine stem pessaries were inserted (2.3 per cent of the patients under treatment and 1.3 per cent of the operations performed). During the same period 309 patients were treated for dysmenorrhœa, amenorrhœa, sterility, antelexion of the uterus, congenital malformation of the uterus, or stenosis of the cervix. In such conditions the use of the stem is frequently indicated and yet it was employed in only 51.7 per cent of these cases.

Thus this series, which demonstrates the treatment given by 28 surgeons in 96 private and 100 ward cases, would seem to represent the conservative use of the stem and its analysis should obviously give us a better conception of the average primary and end-result than a study of a series of cases treated by a single operator.

The indications for the use of the stem were: dysmenorrhœa in 107 cases (52.2 per cent), sterility in 47 (22.9 per cent), dysmenorrhœa and sterility in 23 (11.2 per cent), and conditions other than dysmenorrhœa or sterility in 15 (7.3 per cent). In 13 of the private cases the indications for the operation were not learned. Insertion of the stem alone was done in 147 cases and was combined with minor operations in 45 cases.

Preliminary to the insertion of the stem, division and curettage with a sharp curette were done 173 times; division and curettage with a dull curette, 11 times; and division alone 21 times. The curetted tissue was examined microscopically in

only 48 cases. Normal endometrium was found in 33 (68.8 per cent), hyperplasia in 10 (20.8 per cent), and interstitial changes in 5 (10.4 per cent).

The stem remained *in situ* in 16 of 124 cases for less than one month; in 36, from one to two months; in 24, from two to three months; in 3, from four to five months; in 1, for five months; and in 29 (23.4 per cent) it cut out in part or in whole. Hard rubber stems were secured in place by two to four sutures of silkworm gut, and the glass stems by two to four point suspension sutures of the same material secured by shot and washers or bone buttons. Silver wire was used in only 1 case.

In the study of the postoperative sequelæ it was found that in 147 cases of insertion of the stem following a preliminary division or division and curettage with a sharp or dull curette, the temperature remained below 100 degrees F. in 90 (61 per cent) and was above 100 in 57 (39 per cent). Retroversions were present in 4 (3.9 per cent) of the 102 cases which the authors were able to follow up. In 3 cases this retroversion was permanent. There were 5 cases of irregular menstruation following the introduction of the stem. In 3 of the 102 cases (2.9 per cent) there was evidence of a parametritis which was discovered by vaginal examination and evidenced by tender thickening or exudate either in the lateral fornices or posterior to the uterus. In 8 of the cases there were evidences of adnexal disease. Uterine colic was present in 2 of the cases and was not relieved until the stem was removed.

The final analysis of the end-results showed that there were 72 cases of dysmenorrhœa. In 77.8 per cent of these there was improvement, and in 61.1 per cent, relief. In 47 cases of sterility relief was obtained in 23.4 per cent. The cases are analyzed in a number of tables and those which were complicated are reported in detail. The conclusions drawn are as follows:

1. The intra-uterine stem pessary has a limited field of usefulness. It is applicable to 51.7 per cent of cases of dysmenorrhœa, sterility, amenorrhœa, antelexion of the uterus, stenosis of the cervix, or congenital malformation of the uterus. As a concomitant operative measure, it is applicable to 2.3 per cent of the patients treated and 1.3 per cent of operations performed in a gynecological hospital.

2. From its use, sequelæ other than a temporary rise of temperature occur in from 17.6 to 21.8 per cent of the cases. The permanent morbidity varies from 5.8 to 9.8 per cent.

3. As a therapeutic measure for dysmenorrhœa it causes improvement in 77.8 per cent, and relief in 61.1 per cent of the cases. In sterility it gives relief in 23.4 per cent.

4. The intra-uterine stem pessary gives as good end-results as other operative procedures for similar indications and from its use there is less primary invalidism and no greater liability to unfavorable sequelæ.

5. The intra-uterine stem should be employed only in carefully studied and selected cases. C. H. DAVIS.



**Mittweg: Unilateral Alexander Operation and Its Permanent Results** (Die einseitige Alexandersche Operation und ihr Dauerresultat). *Ztschr. f. Geburtsh. u. Gynaek.*, 1920, lxxiii, 151.

The unilateral Alexander-Adams operation cannot fully take the place of the bilateral operation, but has its uses. For a certain number of selected cases it appears to be sufficient. Cases in which it is contra-indicated are those in which the uterus is large and heavy, the ligaments are weak, the woman does heavy work, or there is a tendency to abortion.

Among 94 Alexander operations performed during a period of two years 49 were unilateral. The author finds that from a third to a half of all mobile retrodeviations are suitable for the unilateral operation. Further reports on the permanent results would be desirable.

GLASS (Z).

**Byford, H. T.: A Neglected Form of Cervical Endometritis.** *Chicago M. Rec.*, 1921, xliii, 54.

The diagnosis and treatment of chronic endometritis as it affects the upper portion of the cervix at or contiguous to the internal os has not been well described in the literature. The internal os dilates only slightly, its lumen is crowded with swollen and obstructed glands, and the circulation is interfered with at first by the pressure from within, and later by pressure from without due to a contracting band of inflammatory exudate. On account of such interference resolution does not take place to the same extent as below, and a ring of imperfectly organized connective tissue remains whose upper edge is at or just above the os and whose lower edge merges into the somewhat thickened mucous membrane below it. In multiparæ this band does not necessarily interfere with uterine drainage, but in nulliparæ it usually takes on some of the characteristics of stenosis.

The diagnosis made by means of the sound is confirmed by the results of the treatment, viz., the disappearance of the physical signs and the relief of subjective symptoms such as backache, headache, reflex stomach disturbances, malaise, dysmenorrhœa, menorrhagia, intermenstrual pain, and sterility. The number and severity of the symptoms vary greatly in different cases. Some patients do not complain of many symptoms although chronic inflammation in this location produces more subjective symptoms than inflammation in any other part of the uterus. Its symptoms are often attributed to a corporeal endometritis when such a condition is not present.

In all cases of chronic cervical endometritis or supposed corporeal endometritis a search should be made for induration about the internal os. The first and most noticeable sign in all but the most chronic cases is pain produced by slight pressure of the sound. When the os is anatomically small or is flattened by flexion, the pressure is not painful until it causes some dilatation or straightening or at least until it becomes firm. When the sound is

passed through an inflammatory constriction with slight pressure, its withdrawal is followed by a show of blood at the internal os or by a stain of blood on the sound. That the tenderness is primarily at the internal os, and not due to a general intra-uterine tenderness, is evident from the cessation of the pain almost as soon as the bulbous end of the sound has passed the internal os, even though the sound be manipulated so as to impinge gently against the uterine walls above. When the constriction does not interfere with the passage of the sound a little gentle manipulation can be made to locate the tender area at the internal os. When the ordinary uterine sound thus passes without encountering resistance, a series of graded sounds which taper slightly at the end are necessary both for the diagnosis and the treatment.

In some cases the ring of exudate can be traced by the uterine sound around the entire circumference; in others, a part of the circumference will have no ridge but is flat, smooth, and of a cicatricial hardness indicating partial or complete local destruction of the mucosa.

In two cases the slight dilatation produced by the passage of the uterine sound caused the patient to faint when she got off the examining table. In several cases the patient has turned pale, has been overcome with dizziness, and has been obliged to lie down, take a drink of water, or go to an open window to avoid syncope. This would probably have occurred more frequently but for the fact that many of them remained on the examining table long enough for the effect of the local irritation produced by the examination to wear off. This symptom is found more often in cases of old, well-organized exudates. Painful dilatation of a small, comparatively healthy cervix may cause nausea and a feeling of faintness.

The treatment calls, first of all, for dilatation. Stimulating applications before dilatation are not always well borne and sometimes aggravate the condition. Gradual progressive dilatation is preferred to extreme divulsion at one sitting. The latter is apt to produce one or more lacerations extending through the constriction ring so that further dilatation separates the lacerated edges of the ring without having much effect upon the exudate. Subsequent contraction takes place, requiring one or more subsequent divulsions unless contraction is prevented by the periodic passage of sounds as for progressive dilatation. The repeated mild stimulation of progressive dilatation with graded round dilators not only causes a steady improvement, but often cures the sterility which is due to the presence of the inflammatory exudate rather than to the mechanical obstruction.

Before the dilatation the vaginal vault and cervix are swabbed thoroughly with a 5 per cent solution of phenol followed by a 20 per cent solution of phenol in glycerine to the entire uterine cavity. When a round dilator equal in size to a No. 25 urethral dilator (French scale) can be passed without causing



a show of blood or producing much pain, a stimulating solution of iodized phenol is applied to the entire cervical cavity and dilatation is done twice a month for a few times and then once a month until the parts are in fairly normal condition. When the lumen is large the same treatment is used except that it is begun and ended with large dilators. C. H. DAVIS.

**Hiess, V.: The Pathogenesis of Fistula of the Cervix of the Uterus** (Ueber die Pathogenese der Fistula cervicis uteri laqueatica). *Zentralbl. f. Gynaek.*, 1920, xlv, 1378.

Fistulae of the cervix of the uterus may arise: (1) from trauma; (2) after spontaneous delivery when there is constitutionally defective tissue with pathologic anteversion and a stiff, rigid, external os; and (3) in inflammatory and neoplastic conditions affecting the anterior lip of the os.

The author describes briefly two cases of such fistulae in nulliparae, in the fourth and fifth months of pregnancy. The patients were 32 and 24 years of age respectively. In the first case the foetus had died and was delivered through a tear in the posterior wall of the cervix; in the second, abortion was performed on a patient who suffered from severe melancholy and had made attempts at suicide.

Attention was called to the first case by the discovery of a metreurynter hanging by its stem in the tear in the posterior wall of the cervix. In the second case severe haemorrhage led to inspection. As both were cases of artificial abortion, it might be assumed that the tears were caused by trauma, but such was not the case; there were other factors.

The author believes that rigidity of the external os is one causative factor. A rigid os does not dilate. A balloon-like distension of the cervix therefore occurs and the posterior wall gives way. The typical location of the rupture is 2 or 3 cm. above the os in the posterior wall. The posterior wall gives way instead of the anterior wall as the anterior wall is strengthened by the vesicovaginal septum. Wieczynitz believes that in anteversion during delivery the pressure is exerted chiefly on the posterior wall, as the latter lies in the extension of the axis of the uterus. The tears must be sutured.

VORSCHUETZ (Z).

**Phillips, J.: The Treatment of Uterine Haemorrhage Not Associated with Pregnancy.** *Brit. M. J.*, 1921, i, 224.

The author draws attention to the well-known fact that during the operation of curetting the blood coagulates when mixed with the curetted endometrium. This blood he contrasts with the unclotted blood of the menstrual flow. He speaks of the relationship of ovarian secretion to menstruation and states that in his opinion menstrual bleeding is determined by the balanced action of various internal secretions.

Excessive uterine haemorrhage during the child-bearing period is almost always associated with organic disease of the uterus or some blood disease.

Until our knowledge has improved so that we are able to control the balance of the internal secretion, Phillips believes a hysterectomy should be performed for excessive uterine haemorrhage. At puberty, bleeding may be severe but practically always rights itself. In the child-bearing period fibroids are usually the cause of excessive bleeding and hysterectomy is indicated in almost every case.

At the menopause, if a cervical cancer has become sufficiently advanced to cause excessive haemorrhage a radical operation is of no value. Uterine fibrosis has been regarded as a cause of severe uterine haemorrhage at the menopause. Hypertrophic glandular endometritis is more frequently found. This condition, however, would be more correctly termed "degeneration of the endometrium." After removal of such a uterus the endometrium is discovered to be oedematous and thickened, forming one or more mucous polypi. Attention is called to the fact that blood clots are seldom seen in the uterus following operation although the operation is performed for severe haemorrhage. This points to a probable deficiency of thrombokinase.

In other cases of irregular menopausal haemorrhage no abnormality is discovered in the uterus, either microscopically or macroscopically. Whether or not there is an obvious lesion of the uterine wall or its lining membrane, however, the central cause of the bleeding is an abnormality in the internal secretions. Whenever the bleeding is so severe and so persistent as to make life a burden, the only certain method by which a cure may be obtained is the removal of the uterus. Temporary methods are most uncertain.

W. N. ROWLEY.

**Eden, T. W., and Provis, F. L.: A Record of 76 Cases of Uterine Fibroids and Chronic Metritis Treated by X-Rays.** *Lancet*, 1921, cc, 309.

Forty-six selected cases of uterine fibroid and 30 cases of chronic metritis treated by the authors are reported. The proportion of patients treated who were under 38 years of age was small. Fibroids which extended above the level of the umbilicus were not common.

As irregular or interval haemorrhage is suggestive of malignancy, the body of the uterus is explored to exclude carcinoma before treatment is instituted. If anaemia is marked, hysterectomy is advisable as the haemorrhage may increase after the initial X-ray treatment.

Only simple and uncomplicated cases are treated with the X-ray. Cervical disease, pelvic inflammation, and signs of degeneration are contra-indications to roentgen therapy. All cases are carefully selected in order to avoid indiscriminate treatment.

In the cases classed as cases of chronic metritis the diagnosis was only clinical. If no irregularity or enlargement could be made out, the condition was called metritis for convenience.

The technique of applying the rays, the importance of massive doses, and the continuation of treatment past the amenorrhoea period are discussed.



Exposures are made on two consecutive days, the abdomen being rayed on the first day, and the sacral region on the second. Each treatment comprising the exposure of two consecutive days lasts from three to four hours. The treatments are given at intervals of three or four weeks. From four to six are necessary; at least one is given after amenorrhœa has been induced.

The dosage is determined largely by the judgment of the operator; no accurate method is available at present. The effect of the X-ray is exerted primarily on the ovary. However, shrinkage of the tumor may also result. The effect on menstruation at first is an increase in the flow. Amenorrhœa was produced in all but 5 cases. In 5 cases the menses were controlled sufficiently to relieve the symptoms though they were not suppressed. Partial suppression is not to be regarded as a failure, but rather as an ideal to be attained especially when the dosage can be more accurately controlled. The general effect of the treatments in a few cases was that of fatigue. One or two patients showed marked prostration, but others were stimulated.

Locally the skin was flushed immediately after the treatment and became pigmented later. A mild dermatitis occurred in 3 cases. The uterus in chronic metritis is reduced. Shrinkage of the fibroid tumor was coincident with suppression of menstruation. The other pelvic viscera seemed not to be affected, except possibly in 1 case, which is reported. This was the only case in which any difficulty was encountered and the condition seemed to be more an infection than an X-ray injury to the bowel. Perforation was discovered at operation, but further investigation was impossible as postmortem examination was not permitted.

The symptom of flushing is taken as a guide to the severity of the menopausal effects. In less than 50 per cent of the cases this symptom was reported as slight or absent. In one-eighth of the cases it was reported as moderate, and in three-eighths as severe. The majority of the patients gained weight, but there was no tendency to corpulence.

X-ray treatment has the advantage that it does not interrupt the patient's daily work for more than two days at a time, and the postoperative invalidism is eliminated. X-ray treatment should be the method of choice for women more than 38 years of age who have severe hæmorrhages due to chronic metritis or other conditions in which no neoplasm is present.

W. N. ROWLEY.

#### ADNEXAL AND PERI-UTERINE CONDITIONS

**Kellsall, O. H.:** Varicose Veins of the Broad Ligament: or Varix of the Female Pampiniform Plexus. *Am. J. Surg.*, 1921, xxv, 8.

Varix of the female pampiniform plexus is more frequent than is generally supposed, and because it is at times overlooked, necessary operations upon the uterus or its adnexa for other affections fail to give complete relief.

The causes of broad-ligament varix may be divided for convenience into (1) general, and (2) local.

The general causes consist of: (1) subinvolution of the uterus and ovarian vessels with persistence of pelvic engorgement long after confinement due to unrepaired or unhealed lacerations of the pelvic floor, too early and too great activity following labor, etc.; (2) a relaxed condition of the tissues due to lowered vitality; (3) an unhealthy state of the vessel walls; and (4) absence of valves in the veins.

The local causes are: (1) the anatomical relationship of the ovarian veins which is such that the weight of the long column of blood is sufficient in itself to weaken the vessel walls somewhat; (2) habitual constipation with consequent straining at stool; (3) malposition of the uterus, the organ being bent or turned backward so that torsion of the vessels is produced and the consequent obstruction to the free flow of blood causes venous dilatation; and (4) endophlebitis.

The clinical symptoms are somewhat similar to those of varicocele in the male. The pain is heavy, dull, and aching in character, increased by the long continued erect position, and decreased by the recumbent position. The patient may give a history of malaise, nervousness, and general indisposition, and is somewhat inclined to melancholia. Menstruation may be frequent and profuse, amounting to metrorrhagia, and may occur in women beyond the menopause.

The clinical diagnosis of uncomplicated broad-ligament varix is difficult but as a rule other pathologic lesions and varicosities are associated with it. The knotted and swollen veins are best felt with the patient in the upright position; in the recumbent position only a "doughy" thickening is apparent. The condition is most frequently confused with chronic appendicitis and next most frequently with chronic metritis.

If there is uterine retroversion or retroflexion, palliative measures, replacement, pessaries, the knee-chest position, etc. may be tried. It is well known, however, that usually such procedures merely postpone the operation. The operative treatment consists of multiple ligation of the veins with incision between the ligatures. If the ovary is prolapsed, the Mauclaire-Barrows operation may be performed to advantage.

C. H. DAVIS.

**Wessel, O.:** A New Method of Temporarily Sterilizing Women by Operation (Eine neue Methode der zeitweiligen Sterilisation der Frau auf operativem Wege). *Zentralbl. f. Gynaek.*, 1920, xlv, 75.

Experience has shown that heart and kidney diseases, diabetes, and especially pulmonary tuberculosis, which render pregnancy dangerous, may become so much improved if sterilization is effected that later pregnancy may not be dangerous. Therefore, in such cases temporary sterilization is indicated.

The author recommends the Gutbrod operation which he has performed on six women during the



past two years. This procedure consists in the extraperitonization of the ovaries. The inguinal canal is opened as in the Alexander-Adams operation, the peritoneum is opened at the round ligament, and the ovary is drawn through. The peritoneum is then sutured circularly at its "anterior straight edge" to the margin of the mesovarium. The tubes then lie within, and the ovaries outside of, the peritoneum in the inguinal canal. The inguinal canal is closed as in the Alexander-Adams operation. Menstruation is not disturbed. If the organic disease improves, the ovaries may be replaced very easily and ova may again enter the tubes.

SIMON (Z).

**McClellan, B. R.: Ovarian Dermoid Cysts: Etiology, Diagnosis, and Treatment.** *Am. J. Obst. & Gynec.*, 1921, 1, 493.

It is an established fact that all three germinal layers contribute to the growth of ovarian dermoids. Therefore it is not strange that at times a great variety of histologic products is found in these tumors. Cutaneous derivatives seem to predominate, especially hair and sebaceous material. Teeth, bone, cartilage, glandular tissue, mucous and serous membranes, muscle and nerve fibers, and cerebral substance are discovered. Violet in 1907 reported a dermoid cyst containing thyroid tissue, and another containing lymphatic tissue.

A report from the Mayo Clinic states that of 1,000 ovarian specimens 98 (nearly 10 per cent) were dermoids. Of these, 14 per cent were double, and 7 per cent were malignant. These tumors occur at any age, having been found in premature infants and in a woman of 84 years. Up to the time of puberty they are found more often than any other ovarian tumor. Dermoids cause relatively few menstrual disturbances and apparently do not favor sterility. They are usually monolocular and of small size. Their slow growth favors the development of a long pedicle which is apt to become twisted, especially during pregnancy. This latter condition is prone to cause severe pain and pressure symptoms and may so interfere with the circulation as to produce inflammation and necrosis which may lead to more serious complications such as general peritonitis or fistulæ connecting with the urinary bladder and bowel.

While as a rule these tumors do not attain a size much above that of a man's fist, they occasionally grow very large, as illustrated by 1 case reported by Michinard in which the tumor weighed 6½ lb. The diagnosis is greatly aided by a careful study of the clinical facts. The predominant quality of the cyst contents may also help; for example, if there is much hair, it is possible to get a characteristic crepitation, while if there are many teeth and bony fragments, these may be recognized by the examining fingers. The radiograph is of very great value in view of the fact that so many of these neoplasms contain teeth and bone.

In the matter of treatment there are a few established rules. Remove the tumor always by the

abdominal route. Operate as soon as the diagnosis is made, especially when there is a co-existing pregnancy. When a dermoid is associated with uterine fibromata it should be removed with the uterus. Carefully scrutinize the opposite ovary as it also may show a beginning change. In view of the fact that it is impossible to differentiate ovarian cysts which have been infected, none of these cysts should be tapped at the time of operation. McClellan reports a case of dermoid cyst of the left ovary with twisted pedicle.

C. H. DAVIS.

#### EXTERNAL GENITALIA

**Piccagnoni, G. A.: A Contribution to the Study of Fibromyoma, Sarcoma, and Epithelioma Primary in the Vagina** (Contributo allo studio del fibromioma, del sarcoma e dell'epitelioma primitivi della vagina). *Policlin.*, Roma, 1921, xxviii, sez. chir., 8.

The author reports 3 clinical cases respectively of fibromyoma, sarcoma, and epithelioma of the vagina which were proved by histologic examination. From this study he draws the following conclusions:

Primary tumors of the vagina are rare. Fibromyoma usually develops between the thirtieth and fortieth years of age. As a rule it is isolated and implanted on the anterior walls of the vagina, descending from the uterus or parametrium to which it may remain attached by a pedicle (migratory fibromyoma). Histologically the tumor consists of fibrous tissue intermingled with smooth muscle tissue showing numerous blood vessels with thickened walls. Fibrous tumors of the vagina, though not malignant, may be the cause of pressure symptoms in neighboring organs and of dystocia. At a certain stage in their development they may become hæmorrhagic and purulent. Their gravity may increase on account of degenerative changes (telangiectasia, gangrene, sarcomatous degeneration). The treatment is always operative and consists in enucleation of the tumor from the vaginal walls.

Sarcoma of the vagina may be manifested under different forms, according to whether it occurs in infancy or adult life. In the young it is of a grape form and its point of implantation is almost always on the anterior vaginal wall. It may remain latent for a long time, but give rise to severe hæmorrhage. Its development is local; it does not usually cause metastases in distant organs. In the adult, sarcoma is manifested especially between the thirtieth and fortieth years of age and may be implanted either on the anterior or the posterior vaginal wall. In form it is round and usually sessile. In the early stages it is covered with normal mucosa. Later it ulcerates, setting up metastases in the lymphatic glands, peritoneum, lungs, etc. Histologically vaginal sarcomata are composed of fusiform cells with abundant vascularization and interstitial hæmorrhages. They are of exceptional gravity and if operated upon almost always recur. As far as treatment is possible it is operative.



Primary epithelioma of the vagina occurs most frequently between the fiftieth and sixtieth years of age and usually in the upper posterior wall of the vagina. In form it may be papillary, nodular, or infiltrative. It may extend all around the vagina and hence may be considered an annular cancer. Leucoplasia and chronic irritations of the vagina may be considered as being important factors in the etiology. Histologically vaginal epithelioma is almost always of the pavement-cell type, rarely showing cylindrical cells. The symptoms are purulent, foetid hæmorrhagic discharges and bladder and rectal disturbances. There may be neuralgic pains in the lower limbs if the epithelioma has spread to the pelvis. The prognosis is grave, recurrences being the rule. Dystocia in such cases may be more severe than that due to any other vaginal tumor. The treatment is operative, consisting of partial resection of the vagina or its total removal unless it can be preserved by radium treatment.

Usually vaginal tumors do not hinder conception or pregnancy. Pregnancy, however, may influence the tumor, causing its more rapid development. Labor may be spontaneous if the tumor is limited in its dimensions and if the vaginal walls still possess some elasticity. If the vaginal walls are not distensible there may be copious hæmorrhage and the patient's life may be endangered. In some cases the obstruction to parturition formed by the neoplastic mass may make cæsarean section necessary. In such event preference should be given to the extraperitoneal section according to Costa's method.

W. A. BRENNAN.

### MISCELLANEOUS

**Emge, L. A.: Varicose Veins of the Female Pelvis; a Preliminary Report.** *Surg., Gynec. & Obst.*, 1921, xxxii, 133.

Emge has collected 35 cases of varicose veins of the female pelvis in which the diagnosis was confirmed by operation. He calls to mind the fact that the upper uterine veins and those of the pampiniform plexus empty into the ovarian vein which is poorly supported, joins the renal vein at right angles on the left side, and is without a protective valve.

The causes of varicose veins in the female pelvis are pregnancy, change in position of the uterus (either backward or downward), prolonged pelvic congestion, intestinal ptosis, constipation, interference with the menstrual flow, prolonged menses, prolonged sexual excitement not satisfied by the normal act, and high blood pressure.

The resulting pathology consists of cystic degeneration of the ovaries and later sclerosis, hypertrophic endometritis, hypertrophy of the cervix, passive congestion of the genital tract, fibrosis uteri, and chronic metritis. Sterility is an associated condition.

To give a quick survey of the symptoms and sequelæ in the series of cases reviewed, Tables 1 and 2 are given:

TABLE 1

Location and change in the intensity of pains noticed:	
In both lower quadrants.....	12
In left quadrant only.....	11
In right quadrant only.....	6
Not specified.....	6
Worse when up.....	13
Relieved on lying down.....	22
Not specified.....	13
Worse at catamenia.....	14
Constipated.....	15
Menstrual disturbances:	
Dysmenorrhœa.....	14
Irregular intervals.....	11
Menorrhagia.....	7
Scanty flow.....	5
None.....	8
Probable causes as analyzed from the patient's history:	
Abortion.....	8
Childbirth.....	16
Masturbation, unmarried.....	2
Sexual excess, married.....	1
Visceral ptosis (?).....	3
No reason.....	5
Total.....	35

TABLE 2

Pre-operative diagnosis:		Normal white Leucocy- count count tosis	
Double salpingo-oöphoritis.....	4	3	1
Pelvic inflammatory diseases.....	7	6	1
Malposition of the uterus.....	10	9	1
Malposition and varicose veins.....	5	2	3
Varicose veins.....	6	5	1
"Pelvic tumor".....	1	1	..
Fibroids.....	2	..	2
Total.....	35	26	9
Varicose veins found at operation and associated pathology noted:			
Retroversion.....	20		
Retroposition.....	4		
Descensus.....	2		
Relaxed perineum.....	6		
Intestinal ptosis.....	4		
Cervicitis.....	5		
Piles.....	10		
Fibroids.....	2		
None.....	9		

### Operation and after-results:

Type	No.	Relieved 3 months	6 months or more	Symptoms returned	Patient not seen again
Webster.....	6	..	3	1	2
Kelly-Neel.....	10	..	6	2	2
Gilliam.....	9	3	6	..	..
Coffey.....	1	..	1	..	..
Uterosacral.....	2	2	..	..	..
Resection of veins.....	3	..	2	1	..
Hysterectomy.....	4	..	4	..	..
Total.....	35	5	22	4	4

The diagnosis is based on the symptoms and the presence of a soft boggy mass in the broad ligament which is noted when the patient is standing and



disappears when she lies down. The latter is the differential point between this condition and other swellings in the pelvis. Inflation of the colon will elicit pain in chronic appendicitis but in cases of varicose veins of the broad ligament there will be no such response.

Conservative treatment is directed toward removing the cause of the condition if possible. Thus, constipation and vicerptosis are corrected and the uterus is held up with a pessary. To relieve the congestion use is made of lukewarm douches containing 2 or 3 per cent menthol and 5 per cent alum, and 10 per cent ichthol suppositories.

When the veins have become distended to such a degree that they will probably not return to normal, operative procedures must be considered. Therefore the uterus is lifted up by suspension to promote proper drainage of the veins. This procedure apparently is greatly aided by the shortening of the uterosacral ligaments which act as shelves for the adnexal organs to rest upon. While these shelves may not be permanent, they seem to remain intact sufficiently long to prevent the ovaries from prolapsing and therefore aid in proper venous drainage. In practically all of these cases the ovaries are cystic and at times are three times the normal size. After suspension with adequate drainage they return to normal.

Of greatest importance is a symptomatic cure. The number of cases in which symptomatic relief has been obtained is sufficiently large to warrant the assumption that suspending operations, if carried

out properly and in conjunction with uterosacral shortening, will give the desired result in the treatment of varicose veins of the broad ligaments and of the ovarian veins in particular. Among the suspensions, the various modifications of the Gilliam method seem to promise the best results. If the superior division of the pampiniform plexus is very markedly varicosed it may be necessary to resect some of its veins.

In summing up the author states that the following conclusions may be drawn from these observations:

1. Varicose veins of the broad ligament in general and of the ovarian circulation in particular are comparatively common.
2. In most uncomplicated cases the symptoms are sufficiently plain to suggest the condition.
3. In most instances the diagnosis is made certain by rectovaginal examination with the patient first in the recumbent and then in the sitting position.
4. The differential diagnosis is aided by the normal leucocyte count.
5. Mild and early cases can be permanently relieved by conservative measures.
6. Resection of the veins and hysterectomy are unnecessary to accomplish a cure.
7. A high suspension of the uterus with a shortening of the uterosacral ligaments offers the best chance for a permanent symptomatic cure with a possibility of permanent anatomical regulation.

EUGENE CARY.



# OBSTETRICS

## PREGNANCY AND ITS COMPLICATIONS

**Grad, H.: An Analysis of Fifty Cases of Ectopic Gestation.** *Am. J. Obst. & Gynec.*, 1921, i, 360.

Grad reports a study of 50 cases of ectopic gestation operated on at the Woman's Hospital of New York and elsewhere. He divides these cases into four groups: (1) ectopic gestation with negligible hæmorrhage, (2) ectopic gestation with moderate hæmorrhage, (3) ectopic gestation with severe hæmorrhage, and (4) ectopic gestation with fatal hæmorrhage.

There were 37 cases of the first group, 4 in the second, 7 in the third, and 2 in the fourth.

In the first group the most prominent symptom was pain in 26 cases and uterine bleeding in 11 cases. Only 25 per cent were correctly diagnosed. In 1 case a diagnosis of acute appendicitis was made although the possibility of an ectopic gestation on the right side was considered.

In the second group pain was a prominent symptom in 3 cases and bleeding in 1. In the third group the prominent symptom was collapse, and in the fourth group syncope. In collapse the patient has a thready pulse but her mind is clear. In syncope, the mind is dulled, the patient is not conscious of what goes on about her, and the pulse becomes almost imperceptible. The author believes there is hope in collapse due to a ruptured ectopic pregnancy, but not in syncope.

Forty-eight cases were operated upon. In the first group the ectopic pregnancy was on the right side in 16 cases, on the left side in 20, and in the right horn of the uterus in 1. In the second group the gestation was on the right side in 1 case and on the left in 3. In 2 cases it was interstitial, on the right side in 1 and on the left side in the other.

Cases in the first group frequently escape diagnosis. The patient is not very sick and in the author's opinion spontaneous recovery is frequent. If the diagnosis is established, it is based on the physical findings. Operation is indicated in these cases because the patient may suffer a severe hæmorrhage from repeated rupture of the tube. It may be deferred, however, until the peritoneal irritation subsides and the patient has recovered from the attack of pain. Operations under these conditions have no mortality and very little morbidity.

There should be no difficulty in diagnosing the second group of cases. The hæmorrhage and shock are moderate and the pulse is good, but the pain is severe. However, only 50 per cent are diagnosed correctly. Local examination is not always necessary to establish the diagnosis and, if possible, should be avoided.

Cases belonging to the third group require immediate treatment before the patient is trans-

ported to the hospital. Local manipulation of any kind should be avoided. All efforts should be directed toward maintaining the patient's strength until the bleeding can be controlled by operative measures. The pain should be relieved by morphine, the head lowered, and the extremities bandaged. As soon as possible the patient should be sent to the hospital for operation. A donor should be at hand for a blood transfusion which should be begun before the abdominal incision is made. The transfusion of blood should be continued during the operation and ended only after the abdomen is closed.

Gentle manipulation during the preparation for operation is very essential. The vagina should not be washed. Vaginal examination should be avoided. While the patient is being prepared for operation and the necessary blood tests of the donor are being made a hypodermoclysis of salt solution may be given under the breast.

The operation should be performed quickly. The damaged tube should be excised by a technique which can be executed with expedition and safety. It is not necessary to clean up the peritoneal cavity; only clots which can be readily removed should be sponged out. It is necessary to remove fluid blood only so that the operator may see the operative field. If the case proves to be an interstitial pregnancy with a ragged uterine horn, the tissues in the ragged hole should be rapidly cleared away, all the products of the gestation removed, the fragments of tissue trimmed with the scissors if necessary, and the aperture in the horn of the uterus closed with interrupted sutures, care being taken to suture firmly enough to prevent further bleeding. The suture line in the horn of the uterus should be peritonized if this can be accomplished without prolonging the operation too much. A pus tube on the opposite side is often encountered but a rapid salpingectomy can always be done without danger.

The author believes that in some of the possibly fatal cases in the fourth group life can be saved by well-directed action. In a case of ruptured ectopic pregnancy with syncope effort must be directed first of all to restoring the circulation to a degree compatible with life. Experience has shown that normal saline solution given intravenously is not sufficient to maintain life because it does not remain in the circulation. The author has been using a gum glucose solution with good results. The patient is given an infusion of gum glucose or saline and gum solution before being transported to the hospital and while this is being done a donor is obtained for a blood transfusion. While the preparation is being made for the gum infusion the patient is given a hypodermic of morphine, the extremities are



bandaged, the foot of the bed is elevated, and external heat is applied to diminish radiation. Cardiac stimulants should not be administered as displacement of a clot formed in the bleeding vessels must be prevented. The donor being at hand and the pulse having been restored even partially by means of the gum solution, the patient should be transferred to the operating room and given the blood transfusion at once. After several hundred cubic centimeters of blood have been transfused the anæsthesia may be begun.

M. I. MALONEY.

**Davidson, C. F.: A Case of Abdominal Pregnancy at Seventeen Months.** *J. Am. M. Ass.*, 1921, lxxvi, 590.

A mulatto woman was admitted to Easton Emergency Hospital, December 2, 1920. When she missed the menstrual period in August, 1919, she believed she was pregnant. She had never been pregnant before. October 25, her family physician stated she was three months pregnant. During these three months she had had some pain in the lower part of the abdomen. Her physician gave her a placebo for this and told her she would be confined about May 1.

He saw her again May 9, 1920, and considered her at term. There were very active foetal movements and palpation disclosed a foetus, but the foetal heart was not heard. On May 13 the physician was sent for again as the patient believed that she was in labor. The abdomen was in violent tonic contraction. One-fourth grain of morphine and 80 gr. of bromide were given. During June the patient sent for the physician three times because of pain and nervousness.

On her admission to the hospital the uterus was normal in size and firmness (non-pregnant). The cervix was about the normal size and length. No foetal heart or movements were noted. A hard, round body like a foetal head could be felt in the left hypochondrium under the floating ribs. No body could be palpated. The balance of the tumor was a fluctuating mass in which a wave from side to side was noted when the abdomen was palpated. The whole mass could be mapped out. The appearance of the abdomen suggested a nine months' pregnancy. The patient had felt no foetal movements since May 13, 1920, the day she believed she was in labor. June 13, 1920, normal menstruation came on, lasted four days, and had occurred every four weeks since. There was no menstrual period from July, 1919, to June 13, 1920.

At operation a greenish-gray tumor to which the abdominal wall was adherent was brought into view. On the left side in an area the size of a silver quarter the tumor was firmly adherent. The tube had ruptured and the opening had been closed by the abdominal wall. When these were separated a large hole was torn in the sac wall. This was followed by a gush of about a gallon of dark brown fluid containing particles of dried faecal matter but with no odor. The opening having been made lar-

ger, the foetus was lifted out and the cord cut. The sac was then tied off with the right tube and ovary and taken out. Cutting the cord and tearing the opening in the sac was unaccompanied by a flow of blood. The sac and the skin of the child had the feeling and appearance of leather which had been soaked in water for a long time. The bladder in front and the intestines behind were adherent to the sac. There was a good deal of oozing of blood while these were peeled off and in some places suturing was necessary. Three cigarette drains were placed, one in the pelvis behind the uterus, one in the right iliac region, and one from above. The wound was closed to the drains.

The sac with the placenta weighed 2 lb., 14 oz. The baby was 23½ in. long and 21½ in. across from the tip of one forefinger to the other. It weighed 7 lb., 7 oz., and was absolutely bloodless. The cord was 9 in. long. The sac was 1 in. thick in some areas and as thin as paper in others. The tube was very large and thick and its appearance indicated that it had been ruptured and that the sac and contents had come through the laceration. This rent had occurred on the top of the tube near the fimbriated extremity. It evidently took place during early pregnancy. The pedicle which held the sac to the tube came from the inside of the tube through the rent.

The patient left the hospital, December 24, 1920, in good condition. On January 20, 1921, her physician reported that she had entirely recovered.

EDWARD L. CORNELL.

**Thélin, C.: The Treatment of Placenta Prævia** (*Le traitement du placenta prævia*). *Rev. méd. de la Suisse Rom.*, 1921, xli, 65.

According to Thélin, placenta prævia is observed less frequently than is supposed. It occurs in only about 1 per cent of hospital cases. Thus there were only 466 cases of this condition among 80,000 cases admitted to the Lying-In Hospital of New York City during a period of twenty years. According to the statistics of over 1,331 hospital cases the maternal mortality is about 9.30 per cent and the foetal mortality 53 per cent.

Thélin reviews the methods of treating placenta prævia, especially cæsarean section. He himself has performed a cæsarean section successfully within recent years in 5 cases of placenta prævia in the Lausanne Maternity Hospital.

In Thélin's opinion both cæsarean section and the usual methods have their place in the treatment of placenta prævia. Total rejection of the Braxton-Hicks version and other procedures in favor of the cæsarean operation is not warranted. The decision as to the method to be employed must be based on the indications of the particular case. In regard to the mother's safety the determining factors are: (1) the general condition, (2) the condition of the lower segment of the uterus, and (3) the extent of the placenta prævia. In the case of the child viability is the factor of chief importance. Other



factors are the condition of the area of operation and the surgical skill of the obstetrician.

Fever is an absolute, and anæmia a relative, contra-indication. By the lower segment of the uterus the author means the portion of the corpus and neck which must distend to allow the passage of the fœtus. If its condition indicates a prolonged labor cæsarean section should be considered. Neither the death nor low viability of the child contra-indicates the cæsarean operation.

W. A. BRENNAN.

#### LABOR AND ITS COMPLICATIONS

**Costa, R.: Partial Symphysectomy of the Upper Part of the Symphysis Pubis; A New Operation for the Treatment of Contracted Pelvis with Permanent Results** (La sinfiectomia parziale; asportazione della parte superiore della infissi pubica; una nuova operazione per la terapia dei vizi pelvici con effetti permanenti). *Clin. ostet.*, 1920, xxii, 249.

In cases in which pelvic stenosis is limited to the superior strait and more precisely to the conjugata vera, removal of the upper part of the symphysis pubis opposite the anterior extremity of the conjugata vera and of some of the surrounding bone tissue removes the obstruction to birth; the conjugata vera is lengthened by from 2 to 3 cm. The operation is easy and without danger to any organs in the vicinity, and hæmorrhage need not be feared. Costa has performed it in 4 cases with entirely satisfactory results.

The operation is extra-peritoneal. By a Pfannenstiel incision the space of Retzius is penetrated and gauze compresses are inserted to protect the bladder and peritoneum and to isolate the operative field. The recti muscles are cut transversely to the right and left at about 1 cm. from the median line just above the symphysis. The periosteum of the upper margin of the symphysis is then incised from one pubic spine to the other and from the posterior surface of the symphysis to almost half of its width. With a scalpel a part of the osteocartilaginous tissue is removed from above downward and from the front backward for about half its thickness. The upper part of the symphysis is removed in its entirety.

The first case was that of a woman four months pregnant. The second operation was done in the course of labor in a case in which the conjugata vera was 80 mm. Strong contractions for four hours failed to force the fœtal head beyond the obstacle. Rather than perform a cæsarean operation the author did a partial symphysectomy. A living child was delivered and the woman made a good recovery. The third operation also was done during labor in a case in which the conjugata vera was only 70 mm. After the operation a living child was born spontaneously. The fourth operation was performed on a II-para. The delivery of the first child was effected by means of the forceps. The conjugata vera was 78 mm. After operation, which was done at the end of pregnancy, a living child was born

spontaneously. In all cases the mothers made a good and rapid recovery.

The author draws the following conclusions:

1. The removal of the upper part of the symphysis pubis, partial symphysectomy, is an easy operation.
2. There is no danger from hæmorrhage.
3. The operation may be performed during pregnancy without disturbing the gestation.
4. It leaves a permanent depression corresponding to the osteocartilaginous parts removed, and by this the pelvis is enlarged so that the operation is beneficial for succeeding labors.
5. It can be performed during labor.
6. The mechanism of birth is facilitated as there is easier anterior parietal inclination of the fœtus.
7. There is an elongation of the conjugata vera of from 2 to 3 cm.
8. There is no ambulatory or other trouble following the operation.

W. A. BRENNAN.

**Dorman, F. A., and Lyon, E. C. Jr.: A Critical Study of 270 Cases of Dry Labor.** *Am. J. Obst. & Gynec.*, 1921, i, 595.

From 2,000 histories the authors collected 270 cases of prematurely ruptured membranes in women with viable infants. The rupture occurred at least twelve hours before delivery. This gives an incidence of clinically significant cases of dry labor of 13.5 per cent. The proportion of primigravidaæ was somewhat more than that of multigravidaæ.

The most constant factor in the causation of dry labor seemed to be deformities of the pelvis, these being present in 7+ per cent of the whole number of cases.

In summarizing their conclusions the authors state that their deductions are necessarily confused because in many of the cases there were other reasons beside ruptured membranes which were responsible for prolonged labor, fever, and infant mortality. In other words, obstetrical complications seem to be a cause of dry labor nearly as frequently as dry labor seems to be a cause of complicated labor.

It seems established by these figures, however, that the length of time during which the membranes were ruptured before labor is not an important factor, either in prolonging labor or in causing morbidity or fetal mortality. Protracted duration of the pains in dry labor, on the other hand, greatly increased the morbidity and tripled the fetal mortality.

The morbidity risk increased consistently in proportion to the number of vaginal examinations. There can be no doubt that every vaginal examination of a patient with ruptured membranes is a dangerous procedure. The rectal touch should be employed instead as much as possible.

The use of the dilating bag, even for the purpose of inducing labor, did not reduce the morbidity and seemed unfavorable to the fœtus. With an operative termination in 54 per cent of such induced



labors and an average labor of over twelve hours, the question arises whether induction of labor by bags is justifiable.

Dry labor requires operative termination in one-third of the births. The risks of breech labor are much greater if the membranes are ruptured early.

Dry labor increases puerperal morbidity 8.5 per cent and foetal mortality 3 per cent, the dangerous elements being prolonged labor, intra-uterine contamination (usually from vaginal examinations), and the operative terminations.

EDWARD L. CORNELL.

#### PUERPERIUM AND ITS COMPLICATIONS

**Smead, L. F.: Thrombophlebitis During the Puerperium Following Influenza, with a Report of Cases.** *Am. J. Obst. & Gynec.*, 1921, i, 447.

The present interest in septic, puerperal pelvic thrombophlebitis dates from a paper by Trendelenburg in 1902.

The condition is not infrequent in the puerperium because of the slowed blood current and the opportunities for infection.

The disease consists usually of a streptococcus infection which as a rule enters through the placental site, extends by the ovarian and uterine veins, and results in pyæmia and death in about 50 per cent of the cases. The acute cases are rapidly fatal, but in the subacute cases the prognosis is better largely because the progress of the infection is delayed or blocked by a thrombosis in the pelvic veins. Perivascular and uterine abscesses are common complications.

The clinical course of the disease is marked by a suddenly fluctuating temperature, severe chills, a

relatively low pulse rate, and prolonged course of the disease. A sharply defined, painless, slightly tender, cord-like induration in the region of the pelvic veins can be made out sooner or later. The results of the blood cultures are uncertain. A striking feature is the surprisingly good condition of the patient between the rigors.

The diagnosis of pelvic thrombophlebitis is fairly accurate. Differentiation must be made from septicæmia, pelvic lymphangitis, uterine infection, and thrombophlebitis in other vessels.

The operative mortality is undoubtedly somewhat lower than the non-operative. The indications for operation are hard to define but cases with septicæmia, metastatic foci, and vena cava involvement are not operable.

Prophylaxis consists of intelligent obstetrics, careful asepsis, complete evacuation of the uterus, and good drainage, traumatism and hæmorrhage being reduced to the minimum. The circulation in the puerperium is kept active by good food, fresh air, early rising, and heart stimulation if necessary.

The non-surgical treatment consists of general supportive measures with the avoidance of anything which may dislodge a thrombus such as douches, enemata, and pelvic examinations. Vaccine and serum treatments have been disappointing.

The surgical treatment consists in the ligation or excision of the involved veins by the transabdominal route and the drainage of perivascular abscesses.

Opinion upon the question of surgical intervention in pelvic thrombophlebitis is still divided but all agree that great conservatism must govern the choice of cases and the decision for operation.

The article gives a report of three cases of pelvic puerperal thrombophlebitis following influenza.



## GENITO-URINARY SURGERY

### ADRENAL, KIDNEY, AND URETER

**Taylor, K. P. A.: Nephrolithotomy in Horseshoe Kidney.** *Am. J. M. Sc.*, 1921, clxi, 238.

During the entrance of the foetal kidneys into the abdominal cavity and their ascent to the normal position it is probable that occasionally they are caught in the ring formed by the umbilical arteries. During this arrest in movement, fusion of the two kidneys may take place.

Fusion may occur in any manner. One kidney may be superimposed upon the other ("disk kidney") or the upper pole of one kidney may become fused with the lower pole of the other ("sigmoid kidney"). More frequently, however, the fusion occurs between the two upper or, most frequently, the two lower, poles. The isthmus connecting the two poles varies in thickness from a few centimeters to the normal thickness of the kidneys. The concavity is usually downward and the greater the thickness of the isthmus the more caudal the kidney. The pelves and ureters are usually ventral to the kidney. The blood supply is almost always anomalous. Six or more renal arteries may be found passing to each kidney and there are corresponding veins.

From autopsy statistics the average incidence of horseshoe kidney is found to be 0.7 per cent. The incidence in males is much higher than that in females, some reports estimating it at 14 to 1. Horseshoe kidney is encountered relatively more frequently at operation than at autopsy. This fact is taken to indicate that by reason of its low position and the twist in the renal pelves to attain their ventral position, the horseshoe kidney is predisposed to pathology. The most common lesions are hydronephrosis and pyonephrosis. The diagnosis is occasionally made by inference. If both kidneys are palpated in a distinctly caudal position, and particularly if their lower poles are felt to incline toward the midline, horseshoe kidney should be suggested. The pyelogram may show the pelves lower than normal and distended. Frequently the contrast fluid may run out of the pelves as soon as it is put in because of their vertical position. If a stone is present the shadow may be lower than normal.

Most of the operations upon horseshoe kidney have been directed against a pyonephrosis or hydronephrosis. Exposure and mobilization and control of the hæmorrhage are the main difficulties. Operations for stone have been less frequent. The author cites a number of cases from the literature and gives a detailed account of one case reported by Primrose in which a palpable tumor of the abdomen was presented. Operation revealed a horseshoe

kidney, one organ of which was consumed by a malignant cyst in which many calculi were found. A diagnosis of stone in the left kidney was made before operation. From the cases cited the author draws the following conclusions:

1. The possibility of horseshoe kidney must be borne in mind in the examination of kidney cases which exhibit a caudal position of the kidneys and abdominal pain or tenderness.

2. The transperitoneal operation is the operation of choice in dealing with horseshoe kidney.

3. If a horseshoe kidney is encountered upon lumbar operation and moderate efforts fail to dislocate it, it is advisable to defer further effort rather than to make an enlarged and mutilating incision.

C. R. O'CROWLEY.

**Marchildon, J. W.: Infection of the Kidneys Following Prostatectomy.** *Am. J. M. Sc.*, 1921, clxi, 243.

Marchildon assumes that in all cases of hypertrophy of the prostate with urinary retention there is infection of the bladder. If the prostate is removed immediately, the infection is very apt to spread to the kidney, producing a pyelonephritis. Mention is made of a group of cases in which the urine is clear and sparkling, there is no infection of the bladder and only slight retention but death occurs after a one-stage prostatectomy. In the author's opinion, infection occurs in such cases immediately after the operation, especially infection of the bladder, which results secondarily in pyelonephritis.

In the order of their occurrence the dangers following prostatectomy are toxæmia, hæmorrhage, uræmia, and pulmonary complications.

In a study of the records of the postmortem examinations he has made, Marchildon found that pyelonephritis was a more frequent cause of death than any other condition. When uræmia was the clinical cause of death the postmortem examination demonstrated the presence of infection in the kidneys. The urinary bladder was infected in practically every case and seemed to be the point of origin of the pyelonephritis. The greater number of deaths occurred when the complete prostatectomy was done in one stage. A number of case histories are reported to illustrate the different types of cases and to demonstrate when and how infection occurs.

In the author's opinion preliminary treatment by means of prolonged drainage will prevent a great many deaths following prostatectomy which are due to infection. After free drainage has been instituted and the patient has improved as much as possible, the second stage of the operation may be done.



Marchildon warns against immediate prostatectomy when the urine is found to be clear and there is little bladder retention, as in his experience the mortality is high after the one-stage operation. He advises cystoscopy in every case in which a prostatectomy is contemplated in order that complications such as stone, diverticula, etc. may be discovered and treated.

Systematic catheterization or the use of a retention urethral catheter does not give as good results as the suprapubic cystotomy. The infection is cleared up much more slowly by the former method than by the latter.

The author discusses his experience with hæmorrhage following prostatectomy. He pays little attention to such hæmorrhage as it has not been a cause of death in a single instance. There is little bleeding if the patient has been prepared for operation by prolonged drainage of the bladder.

G. J. THOMAS.

**Hartman, G. W., and Goldman, S. A.: Bilateral Nephrolithiasis.** *California State J. M.*, 1921, xix, 59.

The authors report a statistical study of 42 cases of nephrolithiasis representing all types, and discuss 6 cases in detail.

In 10 cases the condition was bilateral. Thirty-two of the patients were males, and 10, females. The youngest was 22 and the oldest 82 years. The average age was 43 years. The duration of symptoms ranged from two days to thirty-five years. The stones were situated on the right side in 14 cases and on the left side in 16. In 1 of the cases of bilateral stone a horseshoe kidney was found.

A carefully taken history is the first step in the diagnosis as it gives clues from which theories may be formulated. The symptoms of renal calculus are striking and characteristic to one used to interpreting them. In the cases reviewed the chief aid in the diagnosis was the radiogram. In 29 the presence of stones was shown by the X-ray; in 4 cases they were not found by the X-ray, but were later passed. In 2 cases they were found at operation. The physical examination rarely gives positive findings, but is of value in excluding other conditions. The cystoscopic findings were negative in the majority of cases. In 1 case a stone was discovered to be impacted in the ureteral orifice. Functional tests showed marked improvement after the removal of the stone.

Proper preparation is essential for clear radiograms. The authors obtain good results by giving  $\frac{1}{2}$  oz. of castor oil on the morning and evening of the day before the examination, allowing clear fluids but no milk that day and no breakfast on the day the plate is made. Enemas are not given as they tend to produce gas. The examination must include the entire urinary tract and show the bony and soft structures, especially the psoas muscles.

The authors sum up their conclusions as follows:

1. Bilateral nephrolithiasis does not differ essentially in history or symptomatology from unilateral nephrolithiasis.

2. A carefully taken history is the first essential to the proper study of the case.

3. The symptoms of renal calculus are frequently misinterpreted; hence the necessity of correlating all findings.

4. Pain is a constant symptom and varies from a dull ache to colic; radiation of pain is the most suggestive.

5. Frequency of urination is the most common symptom.

6. The physical examination is of value chiefly to exclude other conditions.

7. The cystoscopic findings are not striking.

8. Function is usually depressed on the affected side.

9. The X-ray gives the best evidence, but is not infallible.

10. Proper preparation for the X-ray examination and a study of the entire urinary tract are essential.

11. There is no objection to a pyelogram if the shadow-casting fluid can be drained off.

12. In bilateral involvement, the better side should be operated upon first unless distressing symptoms arise from the poorer side.

13. Patients with bilateral nephrolithiasis may do well if let alone.

14. The fact that some persons are calculus-formers suggests caution in operating and a guarded prognosis.

LOUIS GROSS.

#### BLADDER, URETHRA, AND PENIS

**Bremerman, L. W., and McKellar, M.: Acute Gonorrhœal Urethritis.** *Minnesota Med.*, 1921, iv, 68.

In order to obtain the best results in the treatment of gonorrhœa, the diagnosis is all-important. Exposure and a urethral discharge do not necessarily indicate gonorrhœa. The patient may have a simple, non-specific infection due to staphylococci, bacillus coli, streptococci, or monococcus catarrhalis. These organisms, with the exception of the latter, may be distinguished easily with the microscope. The monococcus catarrhalis is frequently mistaken for the gonococcus as it groups itself similarly, has the same staining qualities, and is gram-negative; it may be differentiated, however, by the fact that it grows rapidly and profusely on almost any medium. The gonococcus grows only on special media, in special environment, and has a longer period of incubation. Occasionally, however, the length of the incubation period is difficult to ascertain because of a history of two or three exposures in the course of a week. Urethral discharge may be the result also of an intra-urethral chance and acute exacerbations of chronic urethritis, and similar conditions considered healed.

The rule that local treatments should not be begun until the acute symptoms have subsided is erroneous.



The organism soon burrows into the underlying structures and there produces marked pathologic changes. Delay allows an increase in the area of mucosa infected, favors numerous other complications, and endangers the posterior urethra. Posterior urethritis should not be considered as a natural stage of the disease, but as a complication.

The treatment, which should be instituted as soon as the diagnosis is made, is simple, but strenuous. The penis is examined with special reference to the meatus with the patient in the dorsal position. If the meatus is below 16 F. a meatotomy is done immediately, the meatus being enlarged up to 26 or 30 F. Protargol, 1 to 2 per cent, argyrol in full strength, albargin, 1 to 2 per cent, or nargol, 2 per cent, is injected into the anterior urethra by means of a 6 to 8 c.cm. syringe fitted with a detachable soft rubber nozzle. Force is not necessary; in fact, is contra-indicated. The anterior canal is filled to slight dilatation, and the solution is retained ten minutes. The patient is instructed to hold the urine for at least two hours. In severe cases the treatment is given three times daily, and in ordinary cases, twice daily.

The discharge is examined microscopically daily, and when it has ceased and there is no evidence of gonococci in the shreds in the urine, a stimulating treatment is begun. This consists of anterior irrigations of hot potassium permanganate solution, 1:1,800 daily. Zinc sulphate solution 1:6,000 or picric acid 1:8,000 may also be used. If this routine is carefully carried out, the duration of the condition will be short and the posterior urethra will rarely become involved.

Posterior urethritis is the most frequent complication. The symptoms are marked frequency of urination and inability to hold the urine. The two-glass test will show that the urine in both glasses contains pus and is cloudy and usually opaque.

In the treatment of posterior urethritis, which is similar to that of the anterior condition, a 20-c.cm. syringe is employed so that not only the anterior urethra is filled, but also the posterior urethra. The injection is given gently and the patient is told to attempt to urinate. This produces muscular relaxation and the solution will run into the posterior urethra where it is retained for from five to ten minutes. Two to three treatments are given daily with the same solutions used in the treatment of anterior urethritis. As a rule the symptoms will clear up in two or three days. The posterior injections are then stopped and the anterior condition alone is treated.

Other complications are phimosis, paraphimosis, peri-urethritis, abscess of the glands of Littre, and sometimes suppurative inguinal adenitis. Acute cowperitis also occasionally follows with the symptoms of mild or severe pain and fullness in the perineum made worse by exercise and by defecation. In this condition the patient should be put to bed, hot applications should be applied to the perineum, and opium and belladonna suppositories given by

rectum to relieve the pain. Active treatment of the anterior urethritis should be continued. Abscess may occur with the usual symptoms of sepsis, frequency, dysuria, tenesmus, or even retention. The abscess should be opened and drained through the perineum.

One of the most dreaded complications of gonorrhoea is arthritis, which usually arises in the third week of the infection. The authors have not seen this condition in patients treated within twenty-four hours after the discharge began. The arthritis may be mono-articular or polyarticular. The patient should be put to bed with extension on the joints; active treatment should be given for the urethritis and local treatment to the joints. The authors consider anti-gonococcal serum almost a specific; 5 to 10 c.cm. are injected as an initial dose and repeated in twelve hours if necessary. If the condition is then not markedly improved, 2 c.cm. are given daily.

Systemic gonorrhoeal infection such as that leading to endocarditis or myocarditis is rare. Infection of the prostate is readily recognized. Massage of the prostate is absolutely contra-indicated. A prostatic abscess should be drained through the perineum. Acute seminal vesiculitis is not rare in the presence of posterior urethritis and prostatitis. Local treatment is necessary; incision is rarely indicated.

Acute epididymitis usually appears in the latter part of the second week, in the early part of the third week, or later. The treatment may be prophylactic, local, and surgical. The urinary bladder may be involved by the extension of the condition from the posterior urethra and give rise to both local and general symptoms. The patient should be put to bed on a liquid diet. Free catharsis should be obtained, and suprapubic hot compresses used. Instrumentation is not to be considered in this condition. Injections should be given, as in posterior urethritis, with sufficient solution to allow a few cubic centimeters to run into the bladder. This should be retained as long as the patient can do so comfortably. The injection should be administered twice daily. Sodium benzoate, 10 gr., should be given internally three times daily.

Patients may be given permission to marry when the urine is free from pus and bacteria and when there are no lesions in the urogenital tract after repeated examinations over a period of three months. The complement-fixation test, which is as valuable in gonorrhoea as the Wassermann reaction in syphilis, must be negative.

The article gives the symptoms and treatment of various complications in detail. C. F. ANDREWS.

**Donovan, W. M.: The Fourth Venereal Disease, Ulcerative and Gangrenous Balanoposthitis: With Case Report.** *Am. J. M. Sc.*, 1921, clxi, 267.

Donovan mentions the scarcity of reports on the so-called "fourth venereal disease," to which Corbus and Harris first called our attention in 1909. He discusses the frequency, history, etiology, pathology,



symptomatology, diagnosis, and treatment of the condition. Bataille and Berdal found it in 2 or 3 per cent of rather a large series of venereal cases. Corbus writes that it is seen infrequently in private practice—about once in 200 cases.

The "fourth venereal disease" is an acute inflammatory disease of the glans penis and the opposed surface of the prepuce which is characterized clinically by ulceration, a copious flow of strongly odorous pus, and at times by gangrene.

Previous to 1889 several forms of balanoposthitis were known, but Bataille and Berdal were the first to recognize this condition as a distinct disease, to demonstrate its infectious, venereal, inoculable, and auto-inoculable nature, and to describe its clinical aspects and etiology.

This disease is caused by an anaerobic vibrio which is gram-positive and by a spirochæta which is also anaerobic but gram-negative. The predisposing causes are: (1) a redundant prepuce with a tendency to phimosis which favors anaerobic conditions, and (2) an unclean preputial sac with decomposing smegma.

Donovan finds two pathologic forms, the ulcerative and the gangrenous, the latter being the result of the former. He describes them as follows:

In the ulcerative form exfoliation of epithelium occurs in numerous spots on the surface lining the preputial sac and preputial meatus. Its progression leads to ulcerations which are irregular in outline, of a somewhat punched-out appearance, and bright red in color with a whitish margin of necrosed epithelium. Later the ulcerations become very deep and are covered by a grayish-white membrane which discharges much yellowish-white pus of a characteristic foul odor.

Microscopically there is infiltration by leucocytes, injection of vessels, and exudation of serum. The spirochæta and fusiform bacilli penetrate the tissues even to the lumina of the blood vessels and the neighboring lymph nodes (Sherber and Muller).

In the gangrenous form the process continues to the state of mortification, sometimes affecting the whole penis and necessitating amputation.

The period of incubation ranges from two to eight days. At first there is mild itching with constant burning pain in the preputial sac and extreme tenderness to manipulation. Exfoliation then occurs and is followed by ulceration and pus. Edema with phimosis, heat, redness, and a palpable dorsal lymph vessel are common. Bilateral inguinal adenitis is frequent, but the nodes do not suppurate.

Constitutional symptoms are absent in the mild cases. The course of the disease is progressive to gangrene unless proper treatment is instituted. Under proper care, the condition is usually cured in two or three weeks unless it is complicated by syphilis.

The diagnosis is confirmed by the finding of the vibrio and the spirochæta in the pus.

Differentiation must be made from chancroid, chancre, gonorrhœa, hyperpreputialis, veneroid ulcer, and ordinary balanitis.

As prophylactic treatment circumcision is advised. The phimosis should be treated by making a dorsal slit to aid in the application of remedies and favor aerobic conditions. The sac should be irrigated every few hours with peroxide of hydrogen solution. Arsphenamin or neoarsphenamin in powder form should be applied to the ulcers daily.

The author concludes his paper with a case report.

G. J. THOMAS.

## GENITAL ORGANS

**Dobson, J. F.:** The Function of the Kidneys in Enlargement of the Prostate Gland. *Brit. M. J.*, 1921, i, 289.

The author claims that to obtain a low mortality in prostatectomies, such as the mortality of 3 per cent reported by Freyer, requires rigid selection of cases.

The percentage of patients with hypertrophied prostates undergoing a prostatectomy varies with different operators. The author operates on about 75 per cent of his cases and finds that this percentage is gradually increasing.

Various conditions contra-indicating prostatectomy are listed. Patients with poor renal function due to back pressure are not infrequently seen among the better classes, but are rarely observed in the clinics. These men present themselves with a distended bladder, at times with complete retention, and often show signs of uræmia. The urine is sterile and the patient's general condition is poor. Such patients are poor risks; they will die if a prostatectomy is done, and if catheterization is resorted to a fatal infection may ensue.

In infected cases the infection may have extended to the kidney, producing a pyelonephritis. A long-standing pyelonephritis inevitably impairs renal function. There is distention of the ureter and renal pelvis, fever, renal pain, and enlargement and tenderness of the kidneys.

As tests of renal function, indigo carmine and phenolsulphonephthalin are used, but the author places the most reliance on the concentration of the blood urea.

The two-stage operation is employed in cases in which there is impairment of the renal function. The preliminary cystotomy is done under local anaesthesia and the time of the second operation under general anaesthesia is much shortened. The two-stage operation gives an opportunity to remove calculi and clean up infection, and relieves the back pressure on the kidneys before the important step in the procedure is carried out. The patient's general condition improves, the uræmic symptoms disappear, the appetite becomes normal, sleep is obtained, and the patient is therefore in a much better condition to stand the shock of a prostatectomy.

Some operators advocate the two-stage operation for prostatectomy in all cases. It is impossible to determine beforehand which cases are good operative risks and the possible benefits of a period of drainage of the bladder should be extended to every



patient. Freyer claims that the two-stage operation delays the necessary radical operation and renders it more difficult to enucleate the tumor because of the induration developing about the suprapubic wound.

In a series of cases in which blood-urea determinations were made it was found that the urea concentration corresponded very closely to the clinical symptoms. Following cystotomy there was a decided fall in the urea content of the blood.

Renal function may be impaired even when there is no infection of the urinary tract. On the other hand, there may be a marked infection without impairment of the renal function.

In preliminary cystotomy in infected cases the author applies the Carrel technique. Tubes are placed in the bladder and antiseptic irrigations are given every two hours. As Dakin's solution is too irritating and flavine is comparatively ineffective, eusol is used in most cases. The bladder is kept dry by a suction apparatus. Under this treatment the pus and foul odor of the urine rapidly decrease and infection about the wound and in the space of Retzius does not occur. This instillation method is effective also in preventing infection in patients with infected bladders. In order to minimize postoperative infections the author continues the antiseptic instillation after the prostatectomy. Undue haste in closing the bladder may at times prevent the clearing up of a serious infection. The urine may be directed through the urethra but pyuria may persist, increase, and act as a typical focus of infection.

By estimating the blood-urea content it is possible to ascertain the amount of impairment of the renal function. Improvement in the infection of the bladder is determined only by ordinary clinical observations.

A. J. SCHOLL.

**Messerschmidt, T., and Messerschmidt, W.: The Bacteriology of Chronic, Post-Gonorrhœal Inflammation of the Prostate and Its Treatment with Autovaccines** (Die Bakteriologie der chronischen postgonorrhœischen Prostataentzündungen nebst therapeutischen Versuchen mittels Autovaccinen). *Deutsche med. Wchnschr.*, 1920, xli, 1416.

In 42 cases of chronic prostatitis the prostate secretion was examined microscopically and culturally and 19 different kinds of bacteria were found. Most of them were staphylococcus albus and aureus, pneumococcus, micrococcus catarrhalis, micrococcus tardissimus, bacillus coli, bacillus pseudo-diphtheriticum, and sarcinæ. Gonococci were found in only 3 cases, although they were all cases of old gonorrhœa.

Mixed autovaccines were made of the bacteria found in each case. After twenty-four hours in physiological salt solution the cultures were removed, killed at 65 degrees, and kept in 1 per cent carbolic acid solution. In other cases the vaccines were not heated but were rubbed up with 0.5 per cent carbolic acid.

The injections of these vaccines were well borne by the patients, and in most of the cases the pain, swelling, and secretion of the prostate disappeared within two or three weeks. In some cases there was no result except a decrease of the bacteria at first, but after further vaccine treatment recovery resulted. In the prostatic secretion diplococci resembling gonococci were frequently found.

VON TAPPEINER (Z).

**Fullerton, A.: Stenosis at the Internal Meatus After Suprapubic Prostatectomy.** *Brit. M. J.* 1921, i, 301.

The author describes the stenosis which occasionally results at the vesicoprostatic orifice following prostatectomy. In certain cases, shortly after the prostate is removed, it is difficult or impossible to pass a catheter or an instrument into the cavity of the bladder even though there is no difficulty in micturition. The instrument seems to be in a free cavity below the bladder; injected fluid reaches the viscus but it is difficult to insert the tip of the instrument into the bladder. This difficulty is due to the lack of the guidance of the prostatic urethra and to the fact that the vesical orifice of the prostate cavity is not in alignment with the direction of the urethra. A contraction of this orifice adds to the difficulty.

Several illustrative cases are given. In one case the author found it necessary to do a suprapubic exploration of the bladder. A tent-like membrane was found almost completely covering the prostatic cavity, the bladder outlet having contracted down to a very small opening. This vesicoprostatic membrane was enlarged. The suprapubic wound then healed readily and after a short time the patient was able to urinate normally.

To prevent recurrence of this condition the author cuts the vesicoprostatic septum at the time of operation. When the complication is suspected, urethral dilators should be passed for some time following prostatectomy.

A. J. SCHOLL.

**Brenner, A.: The Treatment of the Inguinal Testicle** (Zur Frage der Behandlung des Leistenhodens). *Wien. klin. Wchnschr.*, 1920, xxxiii, 1062.

In 1912 Hofstaetter of the Eiselsberg Clinic recommended replacement of the testicle in the abdomen but orchidopexy into the scrotum has been done by most operators, abdominal replacement being recommended by only one other author (Hoepfel). The removal of the inguinal testicle is of course the simplest and most radical procedure, but on account of the internal secretion of the gland this operation should be restricted to cases of gangrene and tumor formation. There are numerous methods for scrotal orchidopexy (over 900) but none is absolutely satisfactory. At best, only about 50 per cent of the cases so treated are cured or benefited.

The abdominal replacement may be preperitoneal or intraperitoneal. In the preperitoneal method the testicle is placed between the peritoneum and the



posterior sheath of the rectus after ligation or removal of the sac, if present. It is either forced through the open processus vaginalis or through a peritoneal slit in the abdominal cavity.

The advantages of intra-abdominal replacement are that the technique of the operation is simple, there is complete closure of the inguinal canal, there is no tension on the testicle, the testicle does not atrophy as easily as following orchidopexy, and there is complete disappearance of the symptoms. The chief objection against the operation is that the testicle cannot be observed later and the development of malignancy cannot be seen. The danger of malignant degeneration, however, is probably overestimated. Moreover, it is undoubtedly less than when the organ is exposed to mechanical irritation. Malignant degeneration of an abnormally replaced testicle has so far not been reported. Differential diagnostic difficulties, however, such as confusion with appendicitis, may arise in the presence of an acute epididymitis. Kinking or torsion of the cord seems of more theoretical than practical importance.

Careful re-examinations of the cases of orchidopexy at the clinic showed that a good result was obtained in only 12 per cent and a satisfactory result in only 32 per cent. In a number of these cases, however, there was considerable pain so that an entirely perfect result was obtained in only 12 per cent. Abdominal replacement gave a perfect result in 78 per cent and it seemed that the intraperitoneal method gave a better result than the preperitoneal method.

SCHUBERT (Z).

#### MISCELLANEOUS

Pleschner, H. G.: *The Physiology and Pathology of Micturition* (Zur Physiologie und Pathologie der Miktion). *Ztschr. f. urol. Chir.*, 1920, v, 148.

This exhaustive work, founded on self observation, anatomical study, and the examination of a large amount of clinical material, clears up many points in regard to the nature of micturition under normal and pathologic conditions, especially in hypertrophy of the prostate and following prostaticectomy.

The desire to urinate is a manifestation of the first reaction of the sphincter muscle of the bladder which prevents the discharge of the urine so long as only a certain amount under a certain degree of pressure is collected in the bladder. As the bladder is able to adapt itself to its contents to a high degree on account of its muscular structure, pressure plays the most important part in its emptying.

The filling and emptying of the bladder is an alternating action of the two antagonistic muscles, the sphincter vesicæ and the detrusor urinæ (Adler). The contraction of one is coupled with relaxation of the other. The action of the detrusor is less; its task is to let the bladder stretch as it slowly fills, and then actively to further the discharge of the urine through the open urethra. The sphincter, on the contrary, keeps the bladder closed while it is filling (positive action), and during micturition allows the

urine to pass through (negative action). This negative phase consists of the passive phase of relaxation and the active phase of staying open during the entire act of micturition.

The term "internal sphincter" is applied to all the smooth circular musculature between the outlet of the bladder and the colliculus seminalis, including from within outward the annulus urethralis (Heiss), the sphincter trigonalis (Kolischer), and the circular musculature of the prostatic part of the urethra. The external sphincter is the striated muscle which forms the boundary between the anterior and posterior parts of the urethra.

In the internal sphincter a distinction must be made between the circular and longitudinal musculature. The action of the circular muscle is known: it opens, relaxes, on micturition. The longitudinal muscle keeps the sphincter open. This conception explains most pathologic conditions. The course of normal micturition is as follows:

As the bladder fills, the contracting sphincter offers resistance to the discharge of the urine by the contractions of the detrusor. If at that time there is no opportunity for micturition, the detrusor adapts itself to the greater fullness of the bladder, but after a while again offers greater resistance to the sphincter. If there is then an opportunity to respond to the demand, the impulse for relaxation of the external sphincter is given voluntarily through the internal pudic nerve. This relaxation is transmitted to the smooth internal sphincter, and by the antagonism between the sphincter and detrusor, causes a contraction of the detrusor and the longitudinal muscle of the sphincter. The urine, under pressure of the detrusor, passes through the open and dilated sphincter and out through the urethra.

Normally, and if not voluntarily interrupted, all of the urine in the bladder is emptied. After it is emptied, only the internal sphincter is in a position to make a water-tight closure between the bladder and urethra, while the striped musculature of the floor of the pelvis (the external sphincter and the accelerator urinæ) forces out the last drops from the urethra.

The phenomena of pollakiuria and polyuria need no explanation. If it is assumed that the internal sphincter causes a desire to urinate by its contraction, it is clear that this desire may be caused also by inflammation around the sphincter, as in posterior urethritis, and by changes in the prostate. Nothing new is to be said regarding changes in the urinary stream and pain on urination.

The question of retention of urine is of great importance. Acute retention of urine, except in spinal and cerebral disease, is always due to mechanical conditions, such as the presence of a foreign body, a stone, or a tumor, or changes in the prostatic part of the urethra, the prostate itself, the external sphincter, or the bulbous part of the urethra. Whatever the site of the obstruction, the irritation is transmitted to the outlet of the bladder.



In the prodromal stage of hypertrophy of the prostate the growing adenoma irritates the sphincter which it pushes before it, causing a desire to urinate, the pollakiuria of prostatics. The prostatic part of the urethra becomes longer, its longitudinal musculature is injured, and it is soon unable to keep the way open for the urine. A greater demand is made on abdominal pressure, as is evidenced by hernia in prostatics. The bladder itself reacts to the increased obstruction by hypertrophy of the detrusor.

In its further course the adenoma proliferates into the longitudinal musculature of the sphincter, makes a rigid tube of the elastic muscle tube which has previously taken an active part in the discharge of the urine, and this rigid tube is subjected to mechanical injury. Slight changes around the urethra or in the adenoma suffice to bring about complete retention. If the urethra has kept a part of its muscular elasticity, however, micturition can be started, though it cannot be completed. The act stops automatically and a part of the urine remains in the bladder as residual urine.

The same consequences are observed in adenoma as in atrophy of the prostate, in the one case being due to an increase in its size and in the other to a decrease. The effect on the longitudinal muscle, however, is the same, as is also the pathologic effect produced. Prostatectomy not only removes the adenoma, but also that important muscle group which has lost its function as a result of the adenoma. The function cannot be restored by the operation, but a functional equivalent is obtained by keeping open the urethra which has undergone cicatricial changes and has become covered over with fresh mucous membrane.

The internal sphincter should not be injured in the operation, but if it is, or if it has been too seriously damaged beforehand, the external sphincter takes over its function. There is now a greater or less space around the urethra, the prostatic cavity. Ejaculation is no longer possible. If the external sphincter also has been injured in the operation, as is frequently the case in perineal prostatectomy, incontinence results. The detrusor is still able to bring the urine to the bladder outlet. The incontinence is caused by a more or less complete loss of function on the part of the external sphincter.

The incontinence in beginning prostatic cases is explained by the fact that the irritation of the growing adenoma causes an increased tendency of the sphincter to contract and this, acting on the longitudinal musculature, causes it to keep the way open for the urine. When the internal sphincter is injured the function of keeping the bladder closed is passed on in greater degree to the external sphincter which is not so well adapted to continuous contraction. The patient will then lose urine when he tries to retain it for a very long time or he may lose it in sleep.

In paradoxical ischuria the internal sphincter has completely lost its function. The bladder, overcoming mechanical obstacles, discharges a part of

its contents until the excessive pressure is over come. Similar conditions are observed when the sphincter is destroyed by ulceration. Disturbances of micturition due to nervous conditions are well explained. Mention is made also of anomalies in micturition caused by changes in the rectum, seminal vesicles, etc.

POSNER (Z).

Scholl, A. J., Jr., and Foulds, G. S.: Prolonged Anuria: Report of a Case. *J. Am. M. Ass.*, 1921, lxxvi, 368.

Absolute retention or anuria producing an excess of the nitrogenous bodies in the blood gives a very different clinical picture from that of uræmia. In anuria the intellect is clear; anorexia and progressive stupor are present, but rarely convulsive symptoms, œdema, or gastro-intestinal disturbances.

In most cases of anuria one kidney is either destroyed or functionally useless. In reported cases proved at autopsy it was found that one kidney was absent in 9 instances, destroyed by stones in 21, and atrophied in 8. In 6 the ureter was obliterated.

Morris reviewed 48 cases of anuria in which operation was not performed and 49 in which operation was performed. Thirty-eight (79 per cent) of the 48 patients died, and 25 (51 per cent) of the 49 recovered.

A case of distinctly urinary poisoning resulting from long-standing complete obstruction of a single functioning kidney is reported. The patient, a woman aged 60, was examined at the Mayo Clinic September 20, 1920. She had had a moderate dull pain in the left side for three months. During the previous four months she had lost 20 lb. in weight and there had been slight hæmaturia.

On cystoscopic examination neither meatus was seen, but a small inflammatory growth was found in the left base of the bladder. The urine, which had been moderate in amount for two months, suddenly stopped and none was passed for fourteen days except 25 c.cm. at one urination.

During this period the patient's mind was perfectly clear and at most times she was quite comfortable. The blood urea gradually rose to 527 mg. per 100 c.cm. and the creatinine increased to 26.6 mg. There was no localizing evidence of obstruction to either kidney, but a bilateral exploration was done in an endeavor to find some mechanical cause of the anuria. The left kidney was found to be three times the normal size, but not hydronephrotic. A decapsulation and pelviotomy were performed. The right kidney was small, sclerotic, and probably functionless. Following operation a large amount of urine drained from the left kidney. The blood urea dropped to 379 mg. and the creatinine to 20.3 mg. for each 100 c.cm. The patient's general condition was at first improved, but she died three days after the operation.

The lack of evidence pointing to the cause or location of the occlusion, a low function prior to the retention, and high blood-nitrogen findings made surgical interference a last resort. An early opera-



tion would have been desirable if the obstruction had been located or the nature of the process had been known.

**Dillon, J. R.: Urinary Incontinence and Its Operative Repair.** *California State J. M.*, 1921, xix, 61.

The four patients whose cases form the subject of Dillon's report were originally operated upon for retention of urine, but as the result of operative accidents they came to the author's care suffering from traumatic incontinence without retention of urine.

Dillon made a careful cystoscopic and endoscopic study to determine the exact condition. The site of injury was seen in all the cases except a case of tuberculosis. At operation it was found that the space between the ruptured ends of the muscles was filled with scar tissue sufficient to allow the sphincters to stand open. In the tabetic and tubercular cases, in which there was complete incontinence the bladder wall and the perineal muscles were markedly atrophied, very soft and friable, and at times very difficult to suture. In the other two cases, in which there was slight control, the muscles were in a much more normal state and the results obtained were gratifying.

In the first case the scar tissue was dissected out, the normal perineal and urethral muscles were found without opening the urethra, the urethral muscles were brought together, the perineal muscles were sutured around the urethra, and the wound was closed without drainage. The results were excellent.

In the second case (that of a patient with tabes) a suprapubic cystotomy was done, the urethral orifice was denuded of mucous membrane, and the torn ends were approximated and sutured. A perineal incision was then made and the external sphincter tightened by removing a portion and suturing the ends together. The patient died one month later.

In the third case, that of a tuberculous patient, a perineal incision was made and the fistula was dissected down to the membranous and prostatic urethra. The cavity remaining after the dissection was so large that no attempt was made to find the normal muscle. The urethral sinus was closed over a sound, the scar-infiltrated perineal muscles being sutured together with difficulty. The previous incontinence persisted.

The procedure followed in the second case was used also in the fourth case. When the patient was dismissed at the end of one month the urinary condition was cured.

LOUIS GROSS.

**Davis, E. G.: Urinary Antisepsis: A Study of the Antiseptic Properties and the Renal Excretion of 204 Anilin Dyes.** *Am. J. M. Sc.*, 1921, clxi, 251.

Davis summarizes previous studies, mentions the possibilities offered by anilin dyes, outlines his method of investigation, and gives his conclusions. Several tables, photomicrographs, and photographs of culture plates are given.

Attention is called to the fact that at the present time there is no drug ideally suited for use as a urinary antiseptic. In this connection reference is made to the previous work of Hinman and others and to the limitations of urotropin as mentioned by Henderson, Palmer, and Burnam.

Most of the previous studies were carried out in the Brady Institute, Johns Hopkins Hospital. Here an attempt was made to correlate the chemical structure with the antiseptic properties and the renal excretion of the compounds studied. Most of these compounds were synthesized for this special purpose with the hope that the introduction of certain groups into the molecule would produce certain desired properties.

These compounds were largely related to phenol-sulphonaphthalein. A summary of the results of the investigation is given as follows:

1. It was possible to establish a certain relationship between chemical structure and renal excretion and to predict the excretion of molecules of certain structure, particularly those of the xanthone group. The halogenation of these compounds interfered with excretion.
2. Many of these compounds, non-toxic, excreted in the urine and antiseptic in water, lost this latter property when tested in voided urine.
3. One compound, chlor-mercury fluorescein, experimentally possessed all the required properties, and when administered intravenously in minute dosage (5 mg.) to dogs and rabbits caused the secretion of antiseptic urine for a definite period of time without injury to the animal.

Clinical investigation of this drug has not been carried out on account of its mercury content, although it was shown that in dogs the single lethal dose was forty times that necessary to cause the secretion of antiseptic urine. Chlor-mercury fluorescein, therefore, approaches the ideal in that: (1) it is antiseptic in high dilution in either acid or alkaline urine, (2) it is excreted by the kidney as rapidly as phenolsulphonaphthalein, and (3) experimentally efficient dosage is without toxicity. Chlor-mercury fluorescein is an organomercury phthalein derivative in which the mercury is present in non-ionic form.

4. Continued experiments along the same lines (Davis and White) have shown that acriflavin and proflavin are antiseptic in high dilution in urine (particularly in alkaline urine) and that intravenous administration of minute dosage (5 mg. per kilo) to rabbits causes the secretion of urine which is antiseptic for a definite period of time without injury to the animal. Normally rabbit urine is usually alkaline. Failure to produce antiseptic urine in dogs by means of a corresponding dosage of the same drug was probably due to the fact that dog urine is usually acid.

Davis' investigation of the antiseptic properties and the renal excretion of 204 anilin dyes was carried on in the laboratories of the College of Medicine of the University of Nebraska with the aid of an



appropriation made by the United States Interdepartmental Board of Social Hygiene.

Anilin dyes were chosen for study because of: (1) the large number of these compounds available, (2) their color and hence their ready detection and quantitative estimation in the urine, and (3) through the work of many observers (Notaby, Churchman, Krumweide and Pratt, Simon and Wood, Kligler, Graham-Smith), the antiseptic properties of certain anilin dyes have become well known and therapeutic possibilities in this field have been indicated. Furthermore, a consideration of the history of the development of the various tests of renal function (Thomas and Birdsall) will call to mind that there are several dyes (fuchsin, rosanilin, indigo-carmin, uranin, trypan blue, and others) which have been used to measure the functional activity of the kidneys and which are therefore known to be excreted without injury to the patient. The staining and penetrating properties possessed by many anilin dyes likewise suggest the suitability of this type of compound for medication of the urethral mucosa. The investigation was undertaken, however, with due realization of the handicap presented by impurities in commercial samples of anilin dyes.

Davis selected a few of the dyes by preliminary test on agar. These were then studied in regard to their antiseptic value in urine, their toxicity, their renal excretion, and their ability to cause the secretion of antiseptic urine following intravenous administration. Finally, he studied the few which were found to be particularly efficient against the staphylococcus on special media as to their efficiency with regard to the gonococcus.

The investigation was divided into five stages as follows: (1) antiseptic values on agar, (2) antiseptic values in urine, (3) toxicity and excretion, (4) experimental urinary antiseptics, and (5) inhibition of the gonococcus. The conclusions drawn were as follows:

1. There is no known drug ideally suited for the purpose of internal urinary antiseptics.

2. Of a total of 204 anilin dyes investigated 61 were found to possess antiseptic properties in agar, and 28 of these were efficient as antiseptics when added to voided urine.

3. Selective action against various organisms were exhibited by no less than 44 dyes. In every case the colon bacillus proved more resistant than the staphylococci. There were only 24 which inhibited the colon bacillus in urine in a dilution of 1:1,000.

4. There was almost no exception to the rule that antiseptic action was exhibited in higher dilution in alkaline urine than in acid urine. Attention is therefore called to the fact that these dyes are most efficient in urine of a reaction which renders urotopin inert.

5. The azo dyes give no promise of value since of 37 of this group studied only 3 possessed antiseptic properties, and these only to a slight degree.

6. Of the triphenylmethanes many were antiseptic in high dilution in urine (some in dilution greater than 1:1,000,000). Of these, however, all but one were toxic and none was excreted by the kidney. This group is nevertheless worthy of further investigation.

7. Of 21 dyes of the xanthone group 3 were antiseptic in voided urine, and 2 of these were excreted to a moderate degree.

8. Of 4 acridine dyes 2 were antiseptic in urine. Neither was excreted.

9. Of 9 dyes of the azine group 5 were antiseptic in urine, and 3 of these (safranin T, safranin OW, safranin MN) were excreted by the kidney with great rapidity and completeness and were non-toxic in 20 mg. per kilo dosage.

10. By a study of 204 anilin dyes chosen at random it has been possible to select 15 which are: (1) antiseptic in urine, (2) excreted by the kidney, and (3) relatively non-toxic. With only 2 of these, however (proflavin and acriflavin), was it possible to demonstrate the secretion of antiseptic urine following intravenous administration.

11. Considering that rapid renal elimination of anilin dyes is not unusual, that there are not a few dyes, relatively non-toxic, which exert a bacteriostatic action when diluted to infinitesimal amounts in voided urine, and that out of 204 dyes it has been possible to select 15 which approach the ideal, and 2 which are experimentally effective, it is within reasonable expectation that a dye clinically suited for use as an internal urinary antiseptic may be discovered or synthesized. Experiments to date indicate that dyes of the triphenylmethane, xanthone, acridin, and azin groups (particularly the latter) give the greatest promise of value.

G. J. THOMAS.

Glingar, A.: *An Adaptable Urethroscope* (Ein Universalurethroskop). *Ztschr. f. urol. Chir.*, 1920, v, 224.

The instrument, which is made by Leiter of Vienna, has the following advantages:

It makes it possible to perform all kinds of examinations and to treat the anterior and the posterior urethra without a change of tubes. The different methods may be used in any desired order. As it is unnecessary to change the wire for light and galvanocauterization, it is possible to perform all the manipulations easily and without the aid of an assistant. It is possible also to perform examinations with tubes of different caliber, to irrigate with a relatively small tube, and to apply snare and cautery treatments. RAESCHKE (Z).



# SURGERY OF THE EYE AND EAR

## EYE

Atkinson, E. L.: *Snow-Blindness: Its Causes, Effects, Changes, Prevention, and Treatment.* *Brit. J. Ophthalm.*, 1921, v, 49.

This article is based on the author's experience as a surgeon in the British army in the Antarctic from 1911 to 1913 and in France and Russia during the recent war. He contrasts snow-blindness with the effect produced by sudden high power electric welding in which there is a blinding flash and also with the effect of telescopic observation of the sun in which there is prolonged exposure to intense illumination.

In the telescopic blindness there is an immediate positive central scotoma which may be absolute and an oscillatory movement and metamorphopsia with usually a loss of light reflex at the macula and some pigmentation in this region. When more than a quarter of the vision is lost it is seldom recovered completely. In Atkinson's opinion both the telescopic and the electric ophthalmia may be due to excessive stimulus from the rays causing coagulation of the tissue elements (the heating effect of the red rays).

Contrasting this with snow-blindness, the author states that when a person becomes snow-blind there is a great preponderance of the rays at the other end of the spectrum, the violet end, and that exposure of the unprotected eye for fifteen minutes is sufficient to bring on an attack with symptoms of grit in the eye, lachrymation, photophobia, and chemosis, while longer exposure may lead to the formation of corneal ulcers, hyperæmia of the retina, and a blurring of the color vision. With treatment the condition lasted forty-eight hours in his cases and recovery was complete.

In another form the effects may be due to selective illumination and lack of contrast causing difficulty in vision, a tiring of the internal and external muscles and consequent diplopia. In this form the acute lachrymation and photophobia are less marked and there are no retinal changes. Such changes are seen when the sun is invisible or the sky clouded and the air is filled with countless ice crystals. Ice crystals have a selective capacity for the violet end of the spectrum, "and this furnishes further presumptive evidence that these rays are the cause of snow-blindness."

Protection from both types of snow-blindness is given only by red and amber glasses which cut out the violet and ultra-violet rays. These should be mounted in a goggle of leather to protect the eye at the side of the lens. Atkinson tests out his goggles with a spectroscope before using them.

T. D. ALLEN.

## EAR

Leland, G. A.: *Abortion of Acute Mastoiditis by the Use of Sir A. E. Wright's Solution.* *Boston M. & S. J.*, 1921, clxxxiv, 251.

Leland makes a plea for the re-establishment of normal drainage of the middle ear through the eustachian tube. This is accomplished by clearing the region in front of the tube and below it, especially in the fossa of Rosenmüller, by means of a nasopharyngeal curette or the sharpened sterile and alcohol-hardened finger-nail. In using the curette, the contour of the spinal column should be borne in mind. With the shank of the instrument in the same side of the mouth, the posterior wall of the fossa is readily and smoothly cleared with an outward and downward sweep. The finger nail may then be used to finish up. As a rule a little belladonna or atropine is then used to diminish the circulation in the throat.

Usually when this treatment is given early, within the first twenty-four to forty-eight hours of the earache, the inflammation in the tympanum immediately subsides. Even when given after three or four days, however, drainage begins, bulging subsides, and the hyperæmia soon disappears if rupture of the membrana tympani has not taken place. After the disappearance of the redness—usually in five days—it is good practice to blow the drumhead away from the inner wall to prevent the formation of adhesions. After five days also a few applications of an organic silver disinfecting and astringent solution to the sides of the nasopharynx, especially into the wounded fossæ, may assist in preventing adhesions.

A few cases are cited in which the procedure described was successfully carried out.

In aborting cases of mastoiditis multiple incisions of the drumhead are made, this being followed by the use of Wright's so-called "drawing" fluid which consists of 1 per cent citrate of soda and 4 per cent sodium chloride. The sodium citrate stops coagulation of the blood and the hypertonic solution of salt induces rapid exosmosis.

One incision is made through the posterior segment of the drumhead and, cutting deep down to the bone, is curved upward and backward on the bony wall of the canal. Three other deep incisions are then made similarly through Shrapnell's membrane, beginning at the posterior fold, and are directed upward and out on the canal. Another is made at the anterior fold, and another directly above the neck of the hammer. After this, warm Wright's solution is poured in and pumped down into the depth of the canal. A light gauze wick is then introduced and saturated with the solution, and a



dry pad is placed over the orifice. The pad is changed as often as it becomes wet, but not the wick in the canal. Usually the pad is soaked every fifteen minutes in the next twenty-four to forty-eight hours. The next morning the wick is changed and warm solution is again poured in.

The author emphasizes the point that this flux of serum is not drainage, but increases the amount of lymph, and therefore its bactericidal action.

O. M. ROTT.

**De Carvalho, A. A.: Eczema of the Ear.** *Brazil-med.*, 1921, xxxv, 49.

Eczema of the auricle may be acute or chronic and depends on the same general factors as eczema elsewhere.

The etiology is local irritation, chemical, mechanical, or infective, occasionally cold, and frequently general conditions such as vasomotor disturbances, rheumatic diathesis, scrofula, diabetes, endocrine disturbance, utero-ovarian pathology, and gastrointestinal toxæmia.

The symptoms are those ordinarily described. The condition must be differentiated from furunculosis, mastoiditis, perichondritis, and periostitis.

The treatment consists in applying protective ointments early and later cleaning off the crusts and applying stimulating ointments. X-ray treatment and injections of sodium cacodylate, mesothorium bromide, and urotropin are also recommended.

The prognosis depends on the underlying cause. Local treatment is a matter of experimentation with the remedies suggested. FRANKLIN P. SCHUSTER.

**Brueggemann, A.: Round-Cell Sarcoma of the Ear-Lobe** (Rundzellensarkom des Ohrläppchens). *Ztschr. f. Ohrenh.*, 1920, lxxx, 100.

In the course of a few weeks a swelling developed in the earlobe of a 9-year-old child after it had been pierced for earrings. The lobe became about three times as thick as normal. The skin was adherent and pale but there was no distinct line of demarcation. The rapid growth of the neoplasm suggested that it was a malignant tumor. The absence of hardness and signs of inflammation indicated that it was not a keloid. The so-called "Haug nodular tuberculosis" was also taken into consideration but was ruled out by the rapid development of the condition. The dermatologist considered tuberculosis as the probable diagnosis.

The cut surface of the tumor showed a homogeneous, firm, yellowish-white tissue. Microscopically no evidence of tuberculosis was found but the entire area was infiltrated with round cells arranged regularly side by side. In one area surrounding several vessels the cells were a little more dense. No plasma cells were seen. At one point there was some invasion of round cells into the cartilage substance. The microscopic diagnosis was mixed round-cell sarcoma showing small and large cells with relatively large oval nuclei.

Sarcomata of the external ear are rare. In the literature only 10 cases are reported and only 2 of the tumors described were round-cell sarcomata.

In the early stages the diagnosis is difficult. Absence of enlargement of the lymph glands speaks for sarcoma and against Haug tuberculosis.

KULENKAMPTT (Z).



# SURGERY OF THE NOSE, THROAT, AND MOUTH

## NOSE

**Hanrahan, E. M., Jr.: The Surgical Treatment of Rhinophyma, with Report of a Case.** *Bull. Johns Hopkins Hosp.*, 1921, xxxii, 49.

The technique employed in this case consisted in cutting away the hypertrophic skin, leaving normal skin above the line of incision and a border of skin approximately  $\frac{1}{8}$  in. wide about the nares. The base was then carefully curetted in order to remove all epithelium, care being taken not to injure the perichondrium. Bleeding was controlled by pressure, hot saline solution, adrenalin, and a few catgut ligatures on the large vessels.

A Thiersch skin graft taken from the thigh was then applied to the denuded area, and a silver foil dressing placed over it. The nose was dressed on the fifth day. It was then kept moist and clean with Dakin's solution applied on compresses moistened every two hours. Healing was complete in fourteen days.

O. M. Rorr.

**Dunlap, L. G.: Perforations of the Nasal Septum Due to Inhalation of Arsenous Oxide.** *J. Am. M. Ass.*, 1921, lxxvi, 568.

Many workers in smelters come into daily contact with pure arsenous oxide, a valuable by-product produced in the smelting of copper ore. This oxide causes a characteristic septal perforation and an associated pathologic condition of the skin, the throat, and the eyes.

The treatment consists of resection of cartilage with approximation of the mucosa, a plastic operation, or the use of a mechanical obturator to relieve the objectionable crusting.

O. M. Rorr.

## THROAT

**Fedele, F.: Primary Lymphosarcoma of the Tonsil** (Linfosarcoma primitivo della tonsilla). *Riforma med.*, 1921, xxxvii, 100.

Fedele's case of primary lymphosarcoma of the tonsil was that of a woman 52 years of age. The tumor, which was removed, was the size of a mandarin orange, round, lobulated, and reddish purple. There was a large patch of superficial ulceration.

Taking into account only tumors of sarcomatous type which may be primary in the tonsil there are: (1) those of parenchymal or lymphoid origin (lymphosarcoma); (2) those of endothelial or perithelial origin (endothelioma, perithelioma); and (3) tumors originating in the stroma (lympho-adenoidal sarcoma, fibrosarcoma).

The differential diagnosis between these types is relatively easy. The only diagnostic difficulty arises in distinguishing between the forms of lymphosarcoma and small round-celled sarcoma.

In the author's case the tumor was situated primarily in the right tonsil, increased in size rapidly, formed metastases in the neighboring lymph glands, became gangrenous, and showed a slight tendency to local infiltration. Such phenomena would suggest sarcoma, but the histologic findings and especially the character of the cellular elements showed the growth to be of the lymphosarcomatous type and more particularly an atypical lymphosarcoma. The form and the character of the nucleus, the character of the cytoplasm, the size of the cells and their variation in type, all favored lymphoblastic evolution. The gangrene observed was superficial, being confined to the mucosa. Some eosinophiles and plasma cells were found in the tumor but this is not unusual.

With regard to the occurrence of sarcoma of the tonsils the author states that in 894 cases of sarcoma Gurth found only 3 involving the tonsil, Heinleth found only 61 sarcomata in 153 cases of malignant tonsillar tumors, and Charcot, in 200 cases, found only 13 lymphosarcomata. Most authors are in agreement regarding the decided malignancy of tonsillar lymphosarcoma; survival varies from two to ten months. Treatment is not promising.

In the author's case an early and rigorous surgical removal of the tumor and thorough clearance of the lymphatic organs and tissues in the regions which were or might be infiltrated resulted in recovery and the patient shows no signs of recurrence.

W. A. BRENNAN.

**Vlasto, M.: A Study of the Indications for Removing Tonsils by Dissection or by Reverse Guillotine.** *Lancet*, 1921, cc, 169.

Two classes of operations are recognized, that is, those performed on children and those performed on adults. The conclusions arrived at regarding the enucleation of tonsils in children are based on a series of 1,500 operations. The two methods described are dissection and the reversed guillotine method. The technique of dissection offers the advantages of complete removal, a clear view of the field of operation, restriction of hæmorrhage, and comparative absence of damage to the pillars. Indications for enucleation by dissection are "chopped" tonsils, small fibroid septic tonsils, and "duffluent" tonsils.

The advantages of the reversed guillotine method include a shorter time for operation, a shallower and shorter anæsthetic; a shorter convalescence, and less after-pain. The use of the guillotine is safe, easy to master, and successful in nearly all cases. An expert anæsthetist is not necessary. From the patient's point of view, the reversed guillotine method is preferable; from the point of view of



the operator, however, there is not the slightest doubt that the dissection method is more satisfactory.

In the cases of adult patients the tonsil is usually elongated and not well adapted to insertion in the ring of the guillotine, and the line of cleavage is not good. The vessels have lost some of their power to contract because of the fibrotic nature of the tonsil and therefore hæmorrhage may be more difficult to control. If the tonsil is dissected, the line of demarcation is more easily found and bleeding vessels may be readily clamped.

In conclusion the author states:

1. The method of operating in cases requiring tonsillectomy should be governed by the type of tonsil.

2. Except when contra-indicated, tonsillectomy in the cases of children should always be effected by the reverse guillotine method, preferably under light general anæsthesia.

3. In the cases of adults dissection of the tonsils is preferable.

J. C. BRASWELL.

### MOUTH

**Brophy, T. W.:** Cleft Palate Extraordinary. *Surg., Gynec. & Obst.*, 1921, xxxii, 182.

In this case the cleft of the palate was in the median line, the premaxillary bones being separated at the central suture and the palate cleft extending throughout the entire length of the hard and soft palates. The lip also was divided in the median line. The patient was 14 months of age. In each premaxillary bone was a central incisor tooth. The columna of the nose was attached to the left side.

The first step in the correction of the deformity consisted in bringing the bones together by passing wire sutures through them above the hard palate. A double suture was carried through the bones at three different points. Heavy lead plates, No. 13 American gauge, were perforated in three places and double wires were carried through these holes and twisted upon the plates, a little force being applied so that they were well tightened. Two anterior and two posterior wires were carried around

anteriorly to the premaxillary bones and tightened. Ten days later the patient was anæsthetized and the wires were tightened. At intervals of about ten days this tightening process was repeated until at the end of the third month the anterior parts of the cleft (the separated premaxillary bones) were in contact and the edges posteriorly were nearly together.

After the parts were approximated, all the wires were removed and new ones were placed in the anterior part through the openings occupied by the first wires. The surfaces in contact were freshened, the compact bone was removed, and the cancellated bone was exposed. The soft parts were sutured together and the new wires were so tightened that the freshened bones were brought into immediate contact. With the soft parts closed by horse-hair sutures, the patient was dismissed. Six weeks later the lip was closed. One month later the hard palate along the edges of the cleft was denuded of mucoperiosteum and the latter coapted, the operation being thus completed.

The outcome in this case disproves the theory that in cases of cleft palate wiring of the bones and bringing them into contact cannot be done subsequent to the sixth month.

In conclusion the author emphasizes the importance of approximating the bones before attempting to close the soft parts.

O. M. RORT.

**Talbot, E. S.:** Interstitial Gingivitis or So-Called Pyorrhœa Alveolaris: An Incipient Form of Scurvy. *Clin. Med.*, 1921, xxviii, 92.

Talbot reports that the alveolar process, the periodontal membrane, the mucous membrane, and the gum tissues are transitory structures, and the slightest irritation or malnutrition and metabolic change will cause them to become diseased.

He claims that the pathology of interstitial gingivitis, or pyorrhœa alveolaris, and scurvy is always the same, whatever the etiology.

The local causes are local irritation and poor dentistry. The constitutional causes are malnutrition and faulty metabolism.

M. N. FEDERSPIEL.



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